

حمل الآن

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المراجعة رقم (1)

الترم الاول



Question 1:Choose the correct answer:

1. The speed of a car is 120 km/s.....The speed of a car is 40 m/s.

- a) Less than. b) Equal to. c) Greater than. d) Twice.

2. A uniform speed of 90 km/h is equal tom/s.

- a) 20. b) 25. c) 30. d) 35.

3. If the time it takes to travel a given distance quadruples, the speed.....

- a) Quadruples its value. b) Decrease by half. c) Decreases by a quarter. d) Doubles.

4. A student took 10 minutes to walk from home to school at an average speed of 2 m/s. Which of the following is the distance between his home and school.....?

- a) 4.8 m. b) 84 m. c) 1.2 Km. d) 3.6 Km.

5. If the value of speed is $V = \frac{d_1 + d_2 + d_3}{t_1 + t_2 + t_3}$, the resulting speed will be an (a)speed.

- a) average. b) increasing. c) zero. d) decreasing.

6. In a race in which a motorcycle makes 7 laps around a square stadium with a side length of 10 meters in a time of 10 seconds, the average speed of the motorcycle is

- a) 70 m/s. b) 28 m/s. c) 7 m/s. d) 32 m/s.

7. If a car and a bicycle move from the same place and in the same direction, and the speed of the car is 50 m/s and the speed of the bicycle is 10 m/s, then after 4 seconds the distance between them becomes meters.

- a) 100. b) 160. c) 200. d) 240.

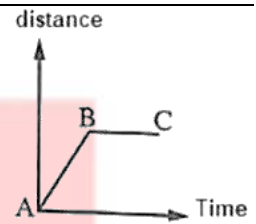
8. The police were chasing a thief, and the thief was driving his car at a speed of 20 m/s. The police fired a bullet at the thief at a speed of 720 km/h. The relative velocity of the bullet, as estimated by the thief, is... km/h.

- a) 740. b) 255. c) 648. d) 800.

9. If $\bar{v} \neq v$, so the body is moving with.....speed.

- a) uniform. b) non-uniform. c) increasing. d) Decreasing.

10. in the opposite figure: The magnitude of the speed of the object in the interval (BC) is equal to the magnitude of in the interval (AB).



- a) Speed. b) Acceleration. c) Distance. d) Time.

11. When a moving object takes 2 seconds to reach a final speed of 5 times its initial speed, the magnitude of its acceleration is the magnitude of its initial velocity.

- a) one-half. b) Equals. c) Twice. d) Two and half time.

12. When a car starts its motion from rest, each of the following is true except

- a) Its speed gradually increases. c) It moves with increasing acceleration.
b) Its final speed is greater than its initial speed. d) Its initial speed is greater than its final speed.

13. When a car moves at a positive uniform acceleration of (10 m/sec^2) , this means that.....

- a) The car speed increases at a rate of 10 m/s every second.
b) The car speed decreases at a rate of 10 m/s every second.
c) The car covers 10 meters each second.
d) The car's acceleration increases at a rate of 10 m/s every second.

14. A body moves with uniform acceleration when.....

- a) its initial speed = its final speed. c) it covers equal distances in equal times.
b) its speed increases by equal amounts in equal times. d) its speed changes by equal amounts in equal times.

15. All of these are examples of scalar physical quantities except:

- a- Length and acceleration. b- Time and mass. c- Mass and speed. d- Time and speed.

16. If a person moves 8 meters towards the north, then 4 meters towards the east followed by 8 meters towards the south, his displacement is..... meters towards the West.

- a) 30. b) 12. c) 8. d) 4.

17. A person throws a tennis ball and it hits a wall 5 meters away and bounces into his hand and he catches it, the displacement =

- a) 10 meters. b) 5 meters. c) Zero. d) 7.5 meters.

18. A body traveling along a circular path makes one and a half turns, the radius of the circle is 12 metres, the magnitude of the displacement is..... metres.

- a) 12. b) 0. c) 24. d) 18.

19. Ahmed and Mohammed are moving with the same magnitude of speed in opposite directions, so they have the same

- a) velocity. b) displacement. c) scalar velocity . d) Relative speed.

20. A rubber ball is dropped from a height of 4 meters from the ground downwards, bounces up 2 metres, and then falls back down to land on the ground, the displacement =..... meters

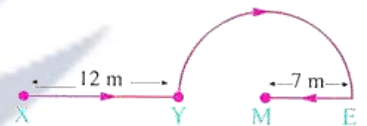
- a) 2. b) 6. c) 4. d) 8.

21. If Ahmed travels 3 meters east from his house to the cinema and his friend Mohammed travels 5 meters west from his house to the same cinema, the displacement from Ahmed's house to Mohammed's house is metres.

- a) 2. b) 3. c) 5. d) 8.

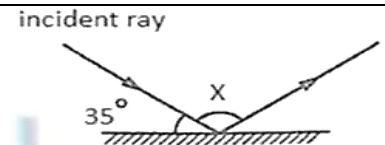
22. In the opposite figure, the object moves from point (X) to point (M) that represents the center of sphere passes through points (Y) and (E), so its displacement =.....

- a) 5m. b) 7m. c) 12m. d) 19m.



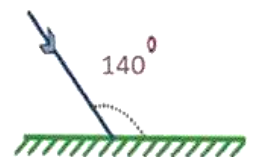
23. If a light ray falls on a plane mirror, as shown in the figure, then the value of the angle x is.....

- a) 35. b) 110. c) 55. d) 70.



24. From the opposite figure: We conclude that

- a) Angle of incidence = 70. b) Angle of reflection = 70.
c) The angle between the incident light ray and the reflecting surface = 50.
d) The angle between the incident light ray and the reflecting surface = 40.



25. A person put a pen in his left pocket and looked in a plane mirror. The pen appeared....

- a) To the left because it is reversed. c) To the right because it is reversed.
b) to the right because it is erect. d) to the left because it is virtual.

26. The following are properties of the image formed by plane mirrors, except.....

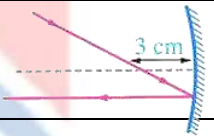
- a) upright. b) laterally inverted. c) Real. d) Equal to the body in size.

27. A body was put in front of a plane mirror at a distance of 4 metres, an image is formed behind the mirror. If the mirror moved towards the body one meter, the distance between the first image and the second image is a..... meter.

- a) 1. b) 3. c) 2. d) 4.

28. In the opposite figure: Radius of mirror curvature =cm.

- a) 3. b) 6. c) 9. d) 12.



29. A concave mirror formed an image of the moon at a distance of 15 cm from the mirror surface. What is the focal length?

- a) 30 cm. b) 5 cm. c) 15 cm. d) 60 cm.

30. An object is located 10 cm from a concave mirror, and an inverted true image of the object is formed. If the object moves toward the mirror at a distance of 3 cm, an image is formed.....

- a) real, inverted, and diminished. c) virtual and diminished.
b) real, inverted, and magnified. d) diminished and magnified.

31. A concave mirror has a radius of curvature = 50 cm. The object is placed at a distance..... until a virtual, up righted and magnified image is formed.

- a) 12 cm. b) 35 cm. c) 25 cm. d) 50 cm.

32. If an object is placed in front of a concave mirror with a focal length of 8 cm, its image is formed at a distance of 20 cm from the mirror. This means that the object is located at a distance ofcm from the mirror.

- a) 8. b) less than 8. c) 20. d) more than 8 & less than 20.

33. A spherical mirror forms a 5 cm real image of a 15 cm object placed at a distance of 20 cm from it. The possible focal length of this mirror is cm.

- a) 8. b) 15. c) 25. d) 80.

34. A concave mirror is placed in the path of the sun's rays, and a very diminished real image of the sun formed at a distance of 15 cm from the pole of the mirror. If the same concave mirror is used to obtain a real inverted image, the object must be placed at a distance of .. cm from its pole.

- a) 15. b) 10. c) 30. d) 40.

35. A person stood at a distance of 30 cm from a mirror and formed a real image with a length equal to $\frac{1}{5}$ of its length. What type of mirror is this person using?

- a) Plane mirror. b) Concave mirror. c) Convex mirror. d) cylindrical mirror.

36. Which of the following represents the light pieces that can form images equal to the object?

- a) Concave mirror, concave lens, plane mirror. c) Plane mirror and concave lens only.
b) Concave lens and convex mirror only. d) Convex lens, concave mirror, plane mirror.

37. Which of the following is a use of lenses?

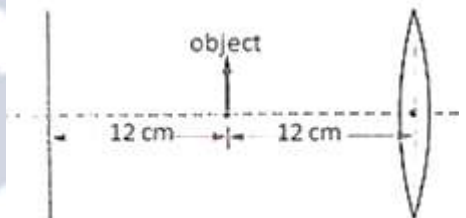
- a) Car headlights. b) Microscope. c) Dentist's lens. d) Solar heaters.

38. The focal length of the thickest lens =.....

- a) 4 cm. b) 6 cm. c) 8 cm. d) 10 cm.

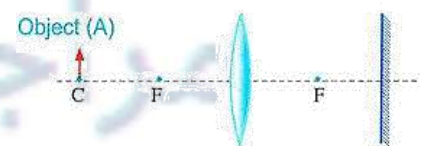
39. In the opposite figure, an object is placed in the middle of the distance between a convex lens with a focal length of 6 cm and a plane mirror. The distance between the image formed of the body by the convex lens and the image formed of the body by the plane mirror is..... cm

- a) 12. b) 24. c) 36. d) 48.



40. If you put an object (A) in the center of curvature of a convex lens, and a plane mirror in its center of curvature of the other side, so the image formed by the plane mirror with respect to the object (A) is.....

- a) upright and equal. c) inverted and equal.
b) upright and diminished. d) inverted and magnified.



41. A lens was placed in the path of the sun's rays, and a very small real image of the sun was formed at a distance of 15 cm from the optical center of the lens. If the same lens is used to obtain a virtual, magnified, upright image, the body must be placed at a distance of cm from its optical center.

- a) 12. b) 5. c) 15. d) 30.

42. A convex lens has a focal length = 50 cm. An object is placed at a distance of = 80 cm from a convex lens, and an image of it is formed at a distance of.....

- a) 30 cm. b) 50 cm. c) 100 cm. d) greater than 100 cm.

43. The ratio between the length of the object and the length of the image formed by the concave lens is

- a) Greater than one. b) Less than one. c) Equal to one. d) Equal to half.

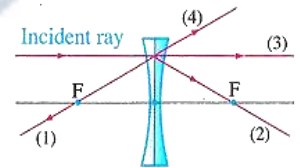
44. Which of the following is the term that describes the point at which light is focused by normal vision of eye?

- a) Retina. b) Lens. c) Eyeball. d) Cornea.

45. The causes of cataracts are all of the following except.....

- a) Genetic predisposition. c) Side effects of drug.
b) Old age. d) Increased convexity of the eye lens.

46. The light ray which completes the correct path of the incident light ray is.....



- a) (1) and (2) together. b) (2) only. c) (3) and (4) together. d) (4) only.

47. Which of the following represents the correct order in the universe.....

- a) Galaxy → Universe → Solar System → Earth. c) Earth → Solar System → Universe → Galaxy.
b) Universe → Galaxy → Solar System → Earth. d) Solar System → Earth → Galaxy → Universe.

48. Recent discoveries in the science of..... have enabled scientists to trace the history of the universe:

- a) Physics and Chemistry. c) Biology and Physics.
b) Chemistry and Biology. d) Physics and Astronomy.

49. The two gases which produced the galaxies, stars and the universe among millions of years are.....

- a) Oxygen and Helium.
- b) Oxygen and carbon dioxide.
- c) Hydrogen and Helium.
- d) Hydrogen and Carbon dioxide.

50. According to the Big Bang theory, within minutes of the creation of the universe, the ratio between hydrogen and helium gases, respectively, was.....

- a) 1:2.
- b) 2:2.
- c) 3:1.
- d) 1:3.

51. The appearance of the first life (Earliest or primitive) on the earth was after..... million year from the massive explosion.

- a) 3000.
- b) 12000.
- c) 15000.
- d) 178000.

52. The solar system lies in a.....Arm of the Milky Way galaxy.

- a) Straight.
- b) Spiral.
- c) Circular.
- d) Cylindrical.

53. Published a research with title "World System" and in-The scientist cludes his imaging about nebula forming the solar system.

- a) Chamberlain.
- b) Laplace.
- c) Molten.
- d) Fred Hoyle.

54. Laplace was influenced when he put the nebula theory into shape by the shape of aplanet in space.

- a) Earth.
- b) Mercury.
- c) Saturn.
- d) Mars.

55. The sun escaped from the gravity of the crossing star due to the force of.....

- a) Gravity.
- b) Centrifugation.
- c) Explosion.
- d) Heat.

56. After the bombed gases were cooled as a result of the explosion of a star.....

- a) Life forms begin to appear on its surface.
- b) Gas particles gather to form solid particles.
- c) The size of the star decreases.
- d) The star returns to its previous shining.

57. The Hubble telescope was launched in April.....

- a) 1905.
- b) 1990.
- c) 1995.
- d) 1959.

58. A chromosome consists of..... chromatid before cell division.

- a) 6. b) 1. c) 3. d) 4.

59. If an ovum of a species contains 3 chromosomes, so its liver cell when divided, each one of the new resulting cells will contain.....

- a) 3 chromatids. b) 3 pairs of chromatids. c) 6 chromatids. d) 6 pairs of chromatids.

60. If the number of chromosomes in a human pancreas cell is 23 pairs of chromosomes What is the number of chromosomes in a skin cell?

- a) 23. b) 11.5 c) 46. d) 11.

61. The number of chromosomes in a pollen grain is....the number of chromosomes in a female egg

- a) Half. b) Double. c) Equal. d) Quarter.

62. The number of chromosomes resulting from meiosis is symbolized by the symbol.....

- a) N. b) 2N. c) $1\frac{1}{2} N$. d) N2.

63. The genes of individuals of the same species differ due to the occurrence of....

- a) Mitosis. b) Crossing over phenomenon. c) Interphase. d) Aurora phenomenon.

64.Follows the same steps of mitosis.

- a) Zygote. b) Meiosis II. c) Meiosis I. d) Cell division.

65. Mitosis is necessary for unicellular organisms to.....

- a) tissue formation. b) Growth in size. c) Reproduction. d) Regeneration.

66. Spore reproduction occurs in the following organisms except.....

- a) Starfish. b) Algae. c) Bread mold. d) Mushrooms.

67. New plants that look exactly like the parent plant can be produced by.....

- a) Gamete formation. b) The occurrence of fertilization. c) Binary fission. d) Tissue culture.

68. A-small sperm and a large egg share the genetic material and traits of a child in a crop of.....

- a) 2:1 b) 1:1 c) 1:2 d) 1:4

69. All of the following cells contain the entire organism's genetic material except.....

- a) zygote. b) pollen grain. c) Bud. d) germ.

70. Asexual reproduction produces offspring..... to the parents and therefore minimizes.....

- a) Genetically non-identical, genetic expression. c) Almost identical, genetic mutations.
b) Genetically identical, genetic variation. d) Partially identical, genetic similarity.

Question 2:

Put (✓) or (×):

1. When an object moves at a regular speed, its average speed is more than its regular speed.	()
2. When the object position changes as time passes, the object is moved during this period.	()
3. When a cheetah whose speed is (27 m/sec.) races with a car that has a speed of (90 km/h), the cheetah precedes (overcomes) the car in this race.	()
4. (Distance - time) graph by a horizontal line parallel to the time axis expresses an acceleration of zero.	()
5. The speed units are equivalent to the acceleration units.	()
6. When an object moves at a constant speed, the acceleration is uniform.	()
7. If the object starts its motion from rest, its initial speed is zero.	()
8. If a cyclist travels 700 m east and then 900 m west, the amount of the displacement is 1600 m east.	()

9. If the object returns to its starting position, the distance is equal to the amount of displacement.	()
10. Dentists use a concave mirror during medical examinations.	()
11. If the distance between the two centers of curvature of a lens is 16 cm, then its focal length equals 8 cm.	()
12. The focus is a virtual point in the middle of the lens and principle axis passes through it.	()
13. The person who fixes the watches uses the lenses.	()
14. The universe contains various galaxies that move away from each other.	()
15. The solar system contains many galaxies.	()
16. Each group of stars is gathered in the solar system.	()
17. The solar system belongs to the Andromeda galaxy.	()
18. Galaxies emerged from the Big Bang.	()
19. Galaxies started to be formed after about 1000 million years from Big Bang.	()
20. The ancestors of galaxies are formed after 5000 million years from Big Bang.	()
21. The two scientists Chamberlain and Molten put the crossing star theory to explain the origin of the universe.	()
22. The crossing star is the largest star that can be seen from the surface of Earth.	()
23. From assumptions of crossing star presence of another star that was revolving near the sun.	()
24. The solar telescope revolves in an orbit around the Earth at a height of about 500 km.	()
25. The chromatin reticulum (genetic material) condenses and appears as long, thin, double threads (chromosomes) in the final phase of mitosis.	()
26. Gametes in living organisms are formed from cells known as somatic cells during meiosis.	()
27. The centromere splits longitudinally into two halves during the first anaphase of meiosis.	()
28. Meiosis results in the formation of two cells, each containing half the genetic material of the parental cell.	()
29. The changes that occur in the final phase of meiosis are called retrograde changes.	()

30. Asexual reproduction produces individuals with identical genetic structure.

()

31. Some plants reproduce vegetatively by seeds.

()

Question 3:

Correct the following underlined words:

1. From speed measuring units are <u>meter/second²</u> or kilometer/hour.	(-----)
2. If the observer is stationary, the relative speed is <u>greater than</u> the actual speed.	(-----)
3. The ratio between the final speed and the initial speed of an object with positive acceleration is <u>equal to</u> one.	(-----)
4. When an object moves with zero acceleration, it means that the speed of the object is <u>increasing</u> .	(-----)
5. A moving car whose speed changes from 20 m/s to 30 m/s in two seconds has an acceleration of <u>10 m/s²</u> .	(-----)
6. To understand many physical phenomena, use <u>acceleration</u> between different variables to describe a specific phenomenon.	(-----)
7. The distance covered by a body moving at a regular speed is <u>inversely</u> proportional to the time needed to cover this distance.	(-----)
8. The acceleration is the value of the <u>speed</u> of an object in one second.	(-----)
9. Acceleration is <u>constant</u> if the object's speed increases by time.	(-----)
10. Displacement is characterized by two properties: magnitude and <u>time</u> .	(-----)
11. An object is moving in a circular path of radius r & covers a distance of πr will have a displacement of $= 2 \pi r$.	(-----)
12. A body moves in a circular path during half a cycle, then the ratio between its displacement and its distance is equal to <u>5\9</u> .	(-----)
13. A person moves 70 m northward then returns 40 m southward, so his displacement is <u>110 m eastward</u> .	(-----)
14. The displacement caused by an object during a unit of time is called <u>non uni-form velocity</u> .	(-----)

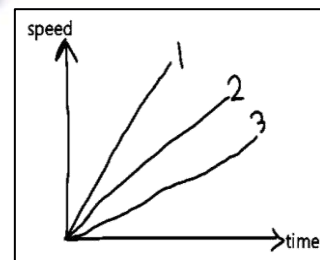
15. The measurement unit of the quantity resulting from dividing the displacement by the time is <u>m/sec²</u> .	(-----)
16. When an aircraft moves against the direction of the wind, the aircraft's velocity <u>increases</u> .	(-----)
17. Pilots take into account the <u>uniform speed</u> of the wind when flying.	(-----)
18. Light rays are <u>passing</u> when falling on the reflected surface.	(-----)
19. The image of the object that is formed by the <u>converging mirror</u> is always virtual and equal to the object.	(-----)
20. The word ambulance is written on ambulance cars as <u>laterally corrected</u> .	(-----)
21. The distance between the object and a plane mirror is <u>more than</u> the distance between the plane mirror and the object's image.	(-----)
22. The <u>focus</u> is a point inside the lens, the principal axis passing through it.	(-----)
23. The focal length of the mirror = <u>2</u> x the radius of curvature of the mirror.	(-----)
24. The <u>plane</u> mirror is placed to the right and left sides of the car's driver.	(-----)
25. A light ray incident parallel to the main axis of a convex lens is refracted passing through <u>optical center</u> .	(-----)
26. If an object is placed in front of a convex lens at <u>the focal point</u> , it forms a real inverted minimized image.	(-----)
27. The focal point of a <u>concave</u> lens is always <u>real</u> .	(-----)
28. The image of the object is formed <u>behind</u> the retina of a near-sighted person.	(-----)
29. The lens is a transparent medium that <u>reflects</u> the light and is defined with two spherical surfaces.	(-----)
30. The contact lenses can stick to the <u>eye pupil</u> , and can be removed easily.	(-----)
31. The older stars gather in the <u>edges</u> of the galaxy.	(-----)

32. The Milky Way Galaxy takes its discoid shape after <u>3000</u> million years from the massive explosion.	(-----)
33. The earth revolves in a fixed orbit around the sun by the effect of the gravity of the <u>earth</u> .	(-----)
34. Big bang theory was placed to explain the origin of <u>solar system</u> .	(-----)
35. Many scientists believe that the universe emerged from a massive explosion called the Big Bang <u>500,000 years</u> ago.	(-----)
36. Sudden violent <u>chemical</u> reactions occur within the star which led to its explosion.	(-----)
37. Spindle fibers in plant cells form from the <u>centrosome</u> .	(-----)
38. When a somatic cell divides three consecutive times, it produces <u>six</u> cells containing the same genetic material as the original cell.	(-----)
39. The nuclei disappear during the mitosis cell division in <u>telophase</u> .	(-----)
40. The number of cells produced at the end of meiosis is <u>one-quarter</u> of the number of cells in mitosis.	(-----)
41. Somatic cells divide <u>meiotically</u> , resulting in the growth of the organism.	(-----)
42. Reproduction occurs by <u>regeneration</u> in bacteria and algae.	(-----)
43. The parental organism disappears when reproduction occurs by <u>budding</u> .	(-----)

Question 4:**Complete the following statement:**

- If an object changes position over time, it is said to be in a state of..... While if it stays in the same position, it is said to be at.....
- The motion of the train represents motion in.....
- The path of motion in one direction may be or or both.
- The two factors that can describe the motion of an object are..... and.....
- The speed of a moving object increases as.....the time taken to cover the fixed distance.
- If the uniform speed of a car is 90 km/h, it means that its speed = m/s.
- Speed..... of an object is difficult to achieve in practice.
- The movement of a car on the road is described as moving atspeed.

9. Cars and aeroplanes are usually equipped with a set of gauges such asand meter.
10. From the terms that are used to determine the amount of irregular speed.....and.....
11.is the regular speed by which an object moves to cover the same distance in the same time it takes to cover that distance.
12. A stationary object is an object whose..... its position relative to a fixed point over time.
13. The value of the relative speed of a moving object varies depending on.....
14. If the direction of the observer is opposite the direction of the moving object, so thespeed is greater thanspeed.
15. If two objects move in the same direction at the same speed, they appear to each other as
16. The relative speed of an object moving faster than an observer moving in the same direction is equal to
17. When a car is traveling at 80 km/h in a certain direction, an observer in a car traveling in the same direction at a speed ofestimates its speed by 20 km/h.
18. If the actual speed of a car is 70 km/h and its relative speed to an observer is 20 km/h. The observer's condition isand the observer's speed equals.....
19.use mathematical relationships between different variables to understand and describe phenomena.
20. The distance-time graph of uniform motion is represented by a..... line passing through the origin.
21. The motion of an object with uniform speed is represented (speed -time graph) by a straight lineto the time axis.
22. The rate of change of distance is....., while the rate of change of speed is.....
23. If the body moves from rest at a uniform acceleration, so its final speed is determined from the relationship.....
24. A truck moves along a horizontal road at a uniform speed of 16 m/s for 4 seconds, so the acceleration of motion during this period of time equals.....
25. The graph showing the uniform acceleration of a moving object hason the vertical axis and.....on the horizontal axis.
26. The line.....represents the motion of the greatest uniform acceleration (+a).
27. Physical quantities are divided into and.....
28. The displacement of the body through an interval time does not depend on the distance but depends on



29. The speed of predator (cheetah) is about
30. The velocity represents per second.
31. The product of the velocity of the body $\times$ time =
32. The velocity agrees with the displacement inand differs from it at.....
33. The movement of wind arises from the....., while its direction is affected by
34. When the direction of the plane is opposite to the direction of the wind, the plane..... decreases and each ofincreases.
35. Light is reflected when it falls on the surface.
36. The angle between the incident light ray and the normal to the point of incidence is called the angle.
37. Types of mirrors includemirrors and.....mirrors.
38. Spherical mirrors are of two types:.....mirror and..... mirror.
39. The stainless steel spoon is considered as an example of the mirror.
40. The point that is in the middle of the reflective surface of the concave mirror is called.....
41. The secondary axis of a mirror is any straight line passing through and any point on its surface except.....
42.mirror is always form.....image, minimized and.....
43. The center of curvature of a concave mirror is located in..... its reflecting surface, while in a convex mirror is located in..... its reflective surface.
44. The radius of curvature of a concave mirror is equal to..... its focal length.
45. The real focus of a spherical mirror is located midway betweenand.....
46. An incident light ray passing through the focal point of a concave mirror is reflected,while a light ray incident parallel to the principle axis of a concave mirror is reflected.....
47. A light ray incident on a concave mirror passing through its center of curvature is reflected by an angle.....
48. The focal length of a concave mirror is equal to the distance betweenand.....
49. The image formed by Or..... mirror must be virtual.
50. In ancient times the scientist..... was able to burn the sails of the Roman fleet by usingmirrors.
51. Theimage is always inverted and the..... image is always upright.

52. The properties of images formed by a Concave mirror depend on
53. Real image is not formed by.....lenses,.....mirrors and plane mirrors.
54. A convex lens with a diameter of 30 cm has a focal length of
55. A convex lens with a distance between its focal point and its optical center of 10 cm has twice the focal length (r).....
56. The normal person can see the near objects clearly at a distance not less than..... and far objects at a distance up to.....
57. The vision defect which is due to a shortness in the radius of the ball is called.....
58.Scientists can determine the heights and the distances by calculating the time of travel of a beam of laser rays.
59. From the Discoid shape galaxy is
60. The solar system consists of one star andplanets revolves around it.
61. The moons revolve around_....., and the planets revolve and the sun and planets revolve around_.....
62. The big bang theory is one of the theories that explained the origin of..... while the theory of crossing star is one of the theories that explained the origin.....
63. The sun is formed after..... million years from Big Bang.
64. The scientists believe that the universe emerged from a massive explosion and it is in.....
65. In the theory of..... it is thought that the universe originates from the great explosion since Originate in it theand energy andtime and followed by expansion and change.
66. According to modern theory, the gaseous cloud was subjected to.....and processes forming the matter of planets.
67. The nucleus of cell contains genetic (heradity) materials which is called.....
68. The chromosome consists of.....connected together at.....
69. The chromosome chemically consists of..... and.....
70. The number of chromosomes is constant in the individuals of.....
71. The gamete has number of chromosomes equals the number in the original cell.
72. Chromosomes appear in interphase in the form of thin net-work filaments called.....
73.division aims to form gametes, whiledivision aims to grow organisms.
74. Mitosis division begins with the..... phase and ends with the.....phase.

- 75.** In prophase, the chromatin reticulum is condensed and appears in the form double threads called..... Anddisappears, and threads of are formed between the two poles of the cell connected to chromosomes at centromere.
- 76.** During prophase..... intensifies, andappears in the form of thin strings.
- 77.** During metaphase..... are directed to the equator of the cell.
- 78.** Spindle fiber threads are formed during cell division in thephase, shrink inphase and disappear in thephase.
- 79.** Spindle fiber threads in animal cells are formed by while in plant cells they are formed by
- 80.** Some somatic cells in humans never divide, such asand while some divide under special conditions, such as
- 81.** The liver's ability to divide under certain conditions represents the scientific basis for the process of.....
- 82.** Meiosis occurs in the anther of a flower to form.....
- 83.** The Egyptian scientist,....., was able to detect and kill cancer cells using technology.
- 84.**Particles are used to detect infected cells whenrays are directed to destroy them.
- 85.** Sexual reproduction depends on two basic processes:.....and.....
- 86.** When the male gamete fuses with the female gamete..... is formed, which contains..... chromosomes.
- 87.** Sexual reproduction is a source of genetic variation due to the occurrence of the.....phenomenon during division.
- 88.** When the zygote grows by..... division, it produces a new individual that combines the genetic characteristics of.....

Question 5:Write the scientific term:

1. An object whose position does not change over time.	(-----)
2. The change of the position of an object relative to the position of another stationary object changes over time.	(-----)
3. -The distance traveled by the object in a unit of time. -The rate of change of distance.	(-----)
4. -The product of the speed of a moving object multiplied by time.	(-----)

-The product of half the magnitude of the speed of the moving object times twice the magnitude of the time in which it moves.	
5. Motion in which the average speed of the object is equal to the uniform speed.	(-----)
6. The thing which moves by constant velocity in the space even the surrounding conditions are changed.	(-----)
7. The motion in which the speed of a moving object changes over time.	(-----)
8. -The amount of change in the object's speed per second. -The rate of change in speed. - A vector quantity, its measuring unit is m/sec. Each second.	(-----)
9. The acceleration at which an object moves when its speed changes by equal amounts in equal times.	(-----)
10. The length of the actual path covered by the moving body from the starting position to the ending position.	(-----)
11. The distance traveled in a straight line in a constant direction.	(-----)
12. The length of the shortest straight line between two positions.	(-----)
13. -The rate of change in displacement. -The magnitude of the displacement over a unit of time.	(-----)
14. -The fastest land animals. - The predator wild animal that its velocity is represented by determining the direction of its motion.	(-----)
15. They are reflective surfaces for light.	(-----)
16. Perpendicular line to the reflecting surface.	(-----)
17. Intersection Point between incident ray, reflected ray and the normal.	(-----)
18. Angle of incidence = angle of reflection.	(-----)
19. The incident light ray and the reflected light ray and the normal line all lie in one plane perpendicular to the reflective surface.	(-----)
20. -A transparent medium that refracts the light. -A transparent medium that refracts the light and is defined by two spherical surfaces; it is usually made of clear glass or transparent plastic.	(-----)

21. The point of convergence or extension of refracted rays that falls parallel to the principal axis.	(-----)
22. -A lens that forms a moderately magnified (virtual) image that is always reduced in size. - A lens that forms a virtual, erect image and always diminished.	(-----)
23. A disease that affects the lens of the eye and makes it opaque.	(-----)
24. The distance between the lens of the eye and the retina.	(-----)
25. Space which contains galaxies, stars, planets, and living organisms.	(-----)
26. Group of stars has a definite arrangement and coordination.	(-----)
27. A Medium-sized body that radiates light and heat.	(-----)
28. Contains all the stars that you can see in the sky.	(-----)
29. Lies in one of the spiral arms of the Milky Way galaxy.	(-----)
30. One of the biggest stars that people on Earth can see.	(-----)
31. The force that preserves the continuity of planets revolving in their orbits.	(-----)
32. Theory that assumed the solar system originated from a glowing gas ball revolving around itself.	(-----)
33. A giant star that attracted the sun, then the solar system was formed.	(-----)
34. The short time glow of a star to become one of the brightest stars in the sky, then its glow gradually disappears.	(-----)
35. The part in the cell which is responsible for cellular division.	(-----)
36. - The phase in which the cell prepares for division by duplicating its genetic material. - A phase where some processes occur upon which the formation of chromosomes that equal in numbers with the parental cell take place.	(-----)
37. A stage of cell division in which the nuclear membrane and nucleolus disappear and the chromosomes become clear.	(-----)

38. - A network of filaments that extends between the two poles of the cell during prophase. - The part responsible for pulling the chromosomes toward the two poles of the cell during anaphase.	(-----)
39. The phase in which the chromosomes are arranged in the middle of the cell during cell division.	(-----)
40. Cells produced by meiosis contain half the number of chromosomes.	(-----)
41. The process of exchanging pieces of internal chromatids in the tetrad.	(-----)
42. The phase in which the chromosome pairs line up on the equator in the center of the cell.	(-----)
43. A phase in which each pair of homologous chromosomes separate from each other without the centromeres dividing, and they move toward the opposite poles of the cell.	(-----)
44. A dangerous disease occurs when some of the body cells are divided continuously without control.	(-----)
45. Cell masses resulting from the continuous, abnormal division of living cells.	(-----)
46. A biological process in which an organism produces new individuals of the same species.	(-----)
47. A structure emerges as a lateral bulge from the mother's cell and contains a nucleus.	(-----)
48. Specialized cells for producing gametes.	(-----)
49. - Contains genetic material from both parents and, upon growth, produces new offspring that combine traits from both parents. - It is resulted from the combination of a male gamete and a female gamete and contains the diploid number of chromosomes (2N) of the living organism. - It is a cell produced due to fertilization and it contains the complete number of chromosomes of the living organism.	(-----)

Question 6:What is meant by (Define) the following:**1.** An aero plane moving at a speed of 1200 km/s?

• (-----)

2. The speed of an object is zero.

• (-----)

3. Uniform speed.

(-----)

4. A car traveling at a uniform speed of 80 km/h.

(-----)

5. An object moving in a straight line and covering a distance of 20 meters every (each) second.

(-----)

6. The average speed of a car is 50 km/h?

(-----)

7. Relative speed

• (-----)

8. The relative speed of a car relative to a moving observer is zero.

• (-----)

9. The ratio d/t of a moving body is constant.

(-----)

10. The slope of the straight line in graphic relationship (distance-time) of a moving body equals 30 m/sec.

(-----)

11. An object moving with a uniform acceleration has a positive value of 3 m/s^2 .

(-----)

12. An object has a negative uniform acceleration of 2 m/s^2 .

• (-----)

13. The displacement of an object is 50 meters east.

• (-----)

14. The distance traveled by an object in an easterly direction is 30 metres.

(-----)

15. The length of the shortest straight line between the two positions of an object's motion is 5 metres.

• (-----)

16. Reflection of light.

• (-----)

17. The plane mirror.

• (-----)

18. Angle of reflection = 30° .

• (-----)

19. The angle between the incident light ray and the reflected light ray = 100°

• (-----)

20. Spherical mirror.

• (-----)

21. Radius of curve of the mirror = 10 cm.

• (-----)

22. The real focus of the mirror.

• (-----)

23. Optical center of Lens.

• (-----)

24. Principal axis of the lens.

• (-----)

25. A concave lens has a radius of curvature of its face = 15 cm.

• (-----)

26. Clusters of galaxies.

(-----)

27. Expansion of the Universe.

(-----)

28. The nebula.

(-----)

29. The phenomenon of star explosion.

(-----)

30. Somatic cells.

(-----)

31. Chromosomes.

(-----)

32. The DNA.

(-----)

33. Tetrad.

• (-----)

34. Vegetative reproduction.

(-----)

35. Fertilization.

(-----)

Question 7:

Give reasons for the following:

1. The metro is an example of motion in one direction.

(-----)

2. -It is practically difficult to make uniform (constant) speed.

-Most of moving cars cannot move inside crowded cities all the time at uniform speed.

-A moving car cannot travel the distance from Cairo to Alexandria at the same speed every time.

(-----)

3. The speed of moving objects increases as the time required covering a given distance decreases.

(-----)

4. The speed increases as the distance covered increases when time is constant.

(-----)

5. The value of the relative speed of a moving object varies depending on the state of the observer.

(-----)

6. A moving observer cannot determine the actual speed of a moving object.

(-----)

7. A car moving at 80 km/h appears to be stationary relative to another car moving in the same direction at the same speed.

(-----)

8. Mathematicians use mathematical re-relations between different variables.

(-----)

9. Physicists use the tools of mathematics, such as graphs and tables.

(-----)

10. Motion with uniform speed is represented in the graphical relationship (distance - time) by an inclined straight line passing through the origin.

(-----)

11. An object whose motion is accelerated cannot move with uniform speed.

(-----)

12. An object moving with a uniform speed has zero acceleration.

(-----)

13. The type of acceleration of an object can be determined by knowing its final velocity and initial speed.

(-----)

14. The person who runs for minutes then walks for other minutes, moves with negative acceleration.

(-----)

15. Displacement is a vector physical quantity while distance is a scalar physical quantity.

(-----)

16. The speed of a moving object is different from the velocity of a moving object.

(-----)

17. The amount of fuel consumed by a plane flies between two cities differs according to the wind direction.

(-----)

18. Pilots take into account the velocity of the wind.

(-----)

19. -When you look in a mirror, you see your face image.

-The human being noticed that when he looked at the still water's surface, he could see the image of his face in the water.

(-----)

20. Light reflection takes place.

(-----)

21. -The incident light ray that falls perpendicular on a reflecting surface reflects on itself.

-A ray incident on a spherical mirror passing through the Center of curvature is reflected back to itself.

(-----)

22. A Plane mirror painted from behind with a thin layer of silver.

(-----)

23. Many people cannot write while looking at their writing in a flat mirror.

(-----)

24. The word ambulance is written in reverse on the front of the ambulance.

(-----)

25. A spherical mirror has one principal axis.

(-----)

26. We use 2 rays from the object at least to get the Formed image.

(-----)

27.- No image of the object is formed when placed at the focus of a concave mirror.

- The image of an object placed in the focus of a convex lens does not form an image.

(-----)

28. We Can't determine the focus or radius of the Convex mirror practically.

(-----)

29. The image formed by a plane mirror , a convex mirror, and concave lens cannot be received on a barrier.

(-----)

30. Concave mirrors are used in the manufacture of solar ovens.

(-----)

31.- The lens has two centers of curvature while the spherical mirror has one center of curvature.

- The collective lens has two focus while the collective mirror has one focus.

(-----)

32. A convex mirror is placed at the corners of narrow roads.

(-----)

33. Convex mirrors are placed on subway platforms and train stations.

(-----)

34. A thick convex lens has a lower focal length than the focal length of a thin convex lens.

(-----)

35. A concave lens is used to correct short-sighted person.

(-----)

36. Using a convex lens to treat long sightedness.

(-----)

37.- Difference of forms of galaxies that form the universe.

- Each galaxy has a characteristic shape

(-----)

38. The galaxy Milky How is given that name?

(-----)

39. The rotating planets stay in their orbits around the sun.

- It is impossible to collide two planets together.

(-----)

40. The distances in the universe are measured by light years.

(-----)

41. The continuous expansion of space.

(-----)

42. Galaxies move away from each other.

(-----)

43. The Nebula loses its spherical shape and is converted to a revolving flat disc according to Laplace theory.

(-----)

44. The theory of the two scientists Chamberlain and Molten is called crossing star theory.

(-----)

45. The Sun escaped from the gravity of the huge star in the crossing star theory.

(-----)

46. Stars are not enough to light the universe although they are large in number.

(-----)

47. The cell undergoes through interphase before the beginning of cell division.

(-----)

48. Mitosis is important for children, unlike meiosis.

(-----)

49. Spindle fibers shrink during anaphase in mitosis.

(-----)

50. Changes occurring in the final phase of mitosis are called reversed changes.

(-----)

51. Meiosis is called reduction division.

(-----)

52. Crossing over causes genetic diversity in individuals of the same species.

(-----)

53. The technology for detecting cancer cells using gold nanoparticles depends on special proteins.

(-----)

54. -Asexual reproduction preserves the genetic structure of the organisms.

- The organism resulting from regeneration reproduction is similar to the parent individual.

(-----)

55. Reproduction in amoebas is asexual.

(-----)

56. The parental individual that reproduces by binary fission disappears.

(-----)

57. Reproduction in yeast is similar to that of sponges.

(-----)

58. The presence of a sporophyte in bread mold.

(-----)

59. Regeneration is not considered reproduction in all cases.

(-----)

60. New grape varieties cannot emerge if propagated vegetables.

(-----)

61. The number of chromosomes remains constant in individuals of the same species that reproduce sexually.

(-----)

62. In sexual reproduction, individuals are produced that carry common traits from both parents.

(-----)

Question 8:

What happens in the following:

1. If the object cut the same distance in half the time with respect to its speed.

(-----)

2. If the moving object takes twice the time to travel half the distance relative to its speed.

(-----)

3. When the velocity of an object is increased to double at a constant rate with respect to the covered distance.

(-----)

4. When a car driver presses the brakes to stop his car after a period of time.

(-----)

5. The movement of the aircraft against the wind in relation to the time of flight and the amount of fuel consumed.

(-----)

6. Light falls on a plane mirror at an angle of 45° .

(-----)

7. Place a plane mirror to the left of the driver instead of a convex mirror.

(-----)

8. The object is closer to a concave mirror according to the size and position of the formed image.

(-----)

9. When gravity is absent?

(-----)

10. Fusion of atomic particles after minutes from Big Bang.

(-----)

11. The nebula loses its temperature according to Laplace theory.

(-----)

12. Explosion of the part that extends between the sun and the crossing star according to the theory of the two scientists Chamberlain and Molten?

(-----)

13. Explosion of a great star?

(-----)

14.- The nucleus is removed from the cell.

- Absence of the nucleus in somatic cells of the liver.
- The cell does not undergo interphase before cell division.

(-----)

15. Mitosis does not occur in somatic cells.

(-----)

16. Absence of a centrosome in an animal cell.

(-----)

17. A human reproductive cell divides by meiosis?

(-----)

18. Crossing over does not occur during meiosis of a reproductive cell.

(-----)

19. Meiosis in the anther and ovary of a flower in plants.

(-----)

20. Focusing laser light on gold nanoparticles in cancer cells.

(-----)

21. The starfish lost one of its arms, which contained part of the central disk.

(-----)

22. Placing the yeast fungus in a warm sugar solution.

(-----)

23. Buds remain attached to the yeast fungus wall.

(-----)

24.- Bursting of the sporangia of the bread mold fungus.

- The germinal capsule in the bread mold bursts.

(-----)

25. A kind of living organisms stops its reproduction process.

(-----)

Question 9:

When the following happen:

1. The speed of an object equals zero.

(-----)

2. The magnitude of speed equal to the magnitude of distance?

(-----)

3. The value of the average speed of a moving object varies with the value of its speed at any moment.

(-----)

4. The relative speed of a car equals three times the speed of an observer who moves at a speed equals 10 km/hr.

(-----)

5. Relative speed of a moving object equals zero.

(-----)

6. Acceleration at which the object moves equal to the amount of the change of its speed.

(-----)

7. Acceleration is positive.

(-----)

8. Acceleration is negative.

(-----)

9. -The displacement caused by a moving object is zero.

- The velocity of an object traveling in a circular path = zero.

(-----)

10. The magnitude of the distance is greater than the magnitude of the displacement.

(-----)

11. The displacement of two different objects is equal?

(-----)

12. Light rays are reflected.

(-----)

13. The mirror's focus produced?

(-----)

14. A real image of an object placed in front of the mirror at the same position.

(-----)

15. A virtual magnified image of an object is formed.

(-----)

16. An approximate minimized image of an object is formed behind the mirror.

(-----)

17. A beam of light passing through the optical center of the lens.

(-----)

18. Placing an object in front of a convex lens (concave mirror) at its focal point.

(-----)

19. Cataract disease of the eye.

(-----)

Question 10:

Compare between the following:

1. average speed and non-uniform speed.

P.O.C	Average speed	non-uniform speed
Definition:		

2. Types of uniform acceleration.

P.O.C	Positive uniform acceleration	Negative uniform acceleration
Definition:		

The relation between final and initial velocity:		
Its sign:		
Happens when:		
Graph:		
The type of motion:		

3. Scalar physical quantity and vector physical quantity (according to: definition -examples).

P.O.C	Scalar physical quantity	vector physical quantity
Definition:		
Examples:		

4. Convex mirror and concave mirror: (Definition - Focal length - center of curvature).

P.O.C	concave mirror	Convex mirror
Definition:		
Focal point:		
center of curvature:		

5. The real image with the virtual image.

P.O.C	real image	virtual image
Definition: (Ability to be received on a screen)		
Formed when:		
Site of its formation regarding the surface of the mirror.		

6. Convex lens and concave lens:

P.O.C	Convex lens	concave lens
Definition:		
uses:		
type of focus type of image it forms:		
how to obtain a virtual image:		

7. The principal focus of a concave mirror and the principal focus of a concave lens :

P.O.C	principal focus of a concave mirror	principal focus of a concave lens
Definition:		

8. shortsightedness and longsightedness in terms of:

P.O.C	Short-sightedness	Long-sightedness
Definition:		
causes:		
The position of the formed image:		
The type of lens used in correcting each one:		

9. the three theories which explain the origin of the solar system:

P.O.C	Nebular theory	The crossing star theory	Modern theory
Founder of the theory:			
Origin of solar system:			

Forces shared in formation of solar system:

10. Somatic cells and reproductive cells in terms of:

P.O.C	Somatic cells	reproductive cells
number of chromosomes:		
type of division:		
number of resulting cells:		

11. Explain the differences between meiosis I and meiosis II.

P.O.C	meiosis I	meiosis II
Differences:		

12. Mitosis and meiosis in terms of:

P.O.C	Mitosis	Meiosis
purpose of division:		
Location:		
number of resulting cells:		
number of chromosomes in the resulting cells:		

13. Metaphase of mitosis and metaphase of meiosis I.

P.O.C	mitosis	Meiosis I
Metaphase:		

--	--	--

14. production by binary fission and reproduction by budding.

P.O.C	binary fission	budding
Definition:		
It occurs in:		

15. reproduction by binary fission and mitotic cell division.

P.O.C	binary fission	mitotic
Types of cell:		

16. Sexual and asexual reproduction.

P.O.C	sexual reproduction	asexual reproduction
the number of individuals involved :		
the type of division upon reproduction which depends:		
the genetic characteristics of the resulting offspring:		

Question 11:Solve the following problems:

- 1.** Which is moving faster and why? A train moving at a speed of 90 km/h or a car covering a distance of 40 meters in 2 seconds.

- 2.** Two bodies, A and B, each move at a constant speed as follows:

Body A moves according to the relation $d = t^2$

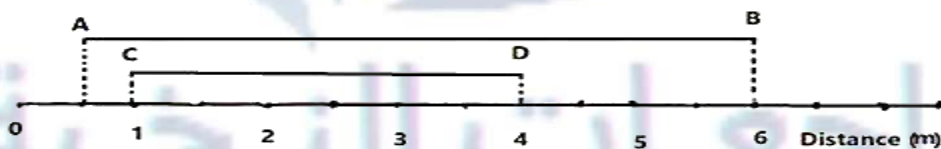
Body B moves according to the relation $d = 2t$. Calculate the ratio between the speed of body B and the speed of body A, knowing that the time of the motion is constant.

3. A train started its journey at five o'clock in the evening. When will it arrive if the train is moved at a speed of 70 km/h to cover a distance of 700 kilometers?

4. A Car moves at a regular speed equals 90 km/h, this means that the car covers a distance equals what (m) in 40 sec.

5. Two cars are traveling from the same starting point. The first is traveling at 60 km/h and the second is traveling at 80 km/h. Calculate the difference between the time the two cars reach the end position, which is 120 km away from the starting point.

6. The following figure shows the distance covered by a bicycle (AB) and the distance covered by the other bicycle (CD). Calculate the difference between distances (AB) and (CD).

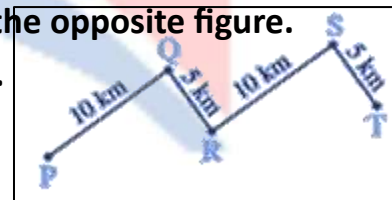


7. Two students walked out of the school, one moving at 2 m/s and the other moving at 3 m/s. Calculate:
- A- Their distance from the school after two minutes.
- B- The time required for each of them to cover a distance of 400 meters.

8. An object travels a distance of 600 meters in one minute and then 720 meters in the second minute. Calculate its average speed:

A) During the first minute. B) During the second minute. C) During both minutes.

9. A car traveled from point (P) to point (T) within 30 minutes as shown in the opposite figure. What is the average speed of the car? Write the mathematical law used.



10. A person covered a distance of 100 km in 2 hours in a car, then stopped for half an hour to rest and then continued his journey by covering a distance of 75 km in 1 hour, what is the average speed of the person and the car in this journey?

11. If a car takes 4 hours on its journey and its speed at the first hour is 100 km/h, at both the second and third hours it is 80 km/h, and in the fourth hour it is 40 km/h. Calculate the average speed.

12. A cyclist covers 45 km at an average speed of 18 km/h, but he covers the first 15 kilometers in an hour. What is the speed at which he covers the rest of the distance?

- 13.** Two trains are traveling in the same direction. If the speed of the first train is 30 km/h and the speed of the second train is 70 km/h, what is the relative speed of the second train to an observer: -Standing on the platform. -Sitting inside the first train.

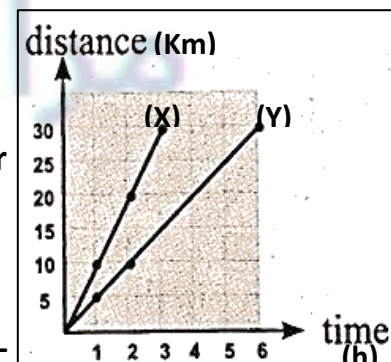
- 14.** Calculate the actual speed of a car that appears to be moving at 50 km/h to an observer moving at 30 km/h in the opposite direction.

- 15.** If the relative speed of the steamship is 550 km/h as monitored by an aircraft moving in the opposite direction at a speed of 425 km/h, What is the time taken by the steamship from the moment it monitors the plane for its movement until it arrives at the port at a distance of 60km?

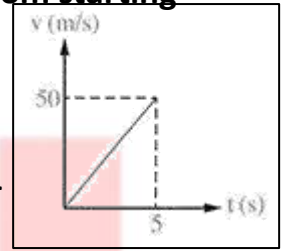
- 16.** Two cars move up a slope. The first car moves upwards at an initial speed of 20 m/s and an acceleration of -2 m/s^2 , while the second car moves downward the same slope at an initial speed of 5 m/s and an acceleration of 5 m/s^2 . If the two cars meet after 6 seconds, calculate the relative speed of the first car based on the driver of the second car.

- 17.** In the figure opposite: Shows the motion of the objects (x and y):

- A) What kind of speed does the object move at?
 B) Calculate the ratio between the speeds of the two objects.
 C) Calculate the ratio between the distance covered by the two objects after 30 minutes from starting the motion.



- 18.** The opposite graph: Shows the relationship between speed and time of an object moving with uniform acceleration from rest. Calculate its final speed after 20 seconds from starting the motion.



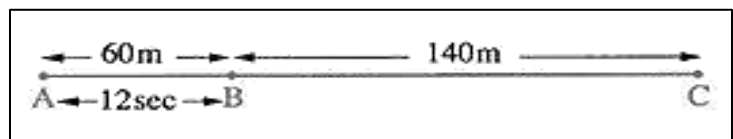
- 19.** A train was moving at a speed of 18 m/s and when the driver applied the brakes it stopped after 3 minutes. Calculate the acceleration of the train, and identify its type.

- 20.** A car is moving at a speed of 80 m/s and when the driver applies the brakes, it acquires a decreasing acceleration of 2 m/s^2 . Calculate the speed of the car after 12 seconds from the moment the brakes are applied.

- 21.** An object moves with (10 m/s) speed, calculate the time required for its speed to become double, knowing that the object moves with an acceleration equals (2 m/s^2).

- 22.** A car moves at a speed of 54 km/h. When the driver uses the brakes to decrease its speed to 36 km/h in 2 seconds, calculate the time needed to stop the car from the moment the brakes are applied. (Knowing that the car moves at a uniform acceleration).

- 23.** An object moves at a uniform speed from point A to point B, covering a distance of 60 m in 12 seconds. Then it moves at a uniform acceleration from point B to point C. Calculate the following according to the relation $[a = 20 \div t]$:



1. The uniform speed in period AB.
2. The final speed in period BC.

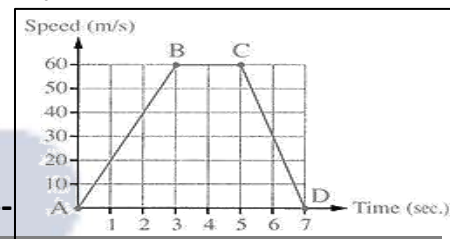
24. A car started moving from rest and after 2 seconds its speed became 4 m/s and remained at the same speed for another 2 seconds. The driver then had to use the brakes to slow down to 2 m/s in the fifth second and came to a complete stop after another 2 seconds.

- 1) Design a table with the speed and time values of the car's motion.
- 2) Graphically represent the motion of the car using the relationship (speed - time).

25. Study the opposite figure, which represents the movement of an object, then answer:

Calculate the acceleration at which the body moves in period (AB).

What type of acceleration is there in period (CD)?



26. If a body starts to move from rest at a uniform acceleration, which can be calculated from the relation: $(\text{acceleration})a = 10/t$, find:

1. The final speed of the body.
2. The type of acceleration of the moving body.

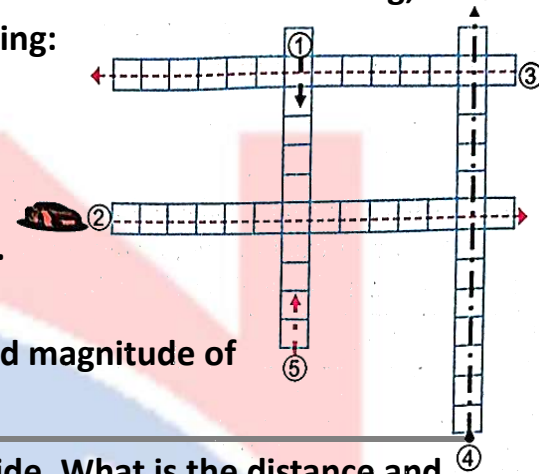
27. An object moves at a uniform acceleration for 15 seconds, reaching a speed of 72 km/h after 5 seconds and then 54 km/h after another 10 seconds:

- (a) Calculate the acceleration of the moving object.
- (b) What type of acceleration is it?
- (c) Calculate the initial speed of this object.

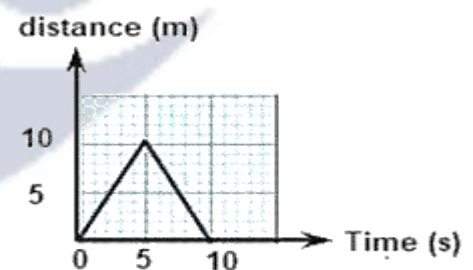
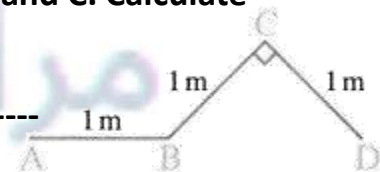
28. Study and concentrate:

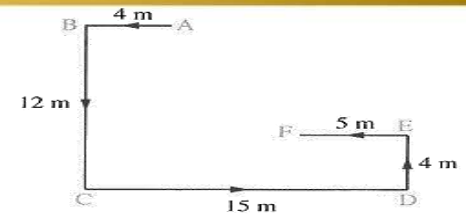
You have 5 cars moving at the same speed of 70 km/h in the paths marked on the drawing, so if the length of the side of the square = 1 km, Answer the following:

1. Cars 2 and 3 reach the end point after passing.....
2. Which of the cars traveled the same distance?.....
3. Cars 2 and 3 are equal in but differ in
4. Cars 1 and 5 meet after passing..... at a distance of km.
5. Calculate the velocity of cars 2 and 4?.....
6. How many cars have the same magnitude of displacement and magnitude of velocity?.....

**29. A rectangular swimming pool is 15 meters long and 6 meters wide. What is the distance and displacement traveled by a swimmer if he swims back and forth?****30. A runner traveled 90 m north in 45 seconds, 180 m east in 60 seconds and 90 m south in 9 seconds, calculate: A - The average speed of the runner. B – Velocity.****31. From the corresponding figure, calculate:**

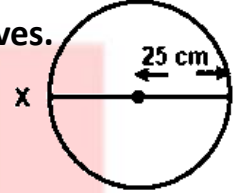
- a) Distance.
- b) Displacement.
- c) Velocity during the first five seconds.

**32. In the opposite figure: An object is moved from A to D, passing through B and C. Calculate the displacement of this object.****33. In the opposite figure: An object moves from point A to point F passing by points B, C, D, and E in 8 seconds, Calculate: 1. Average speed. 2. Average velocity.**

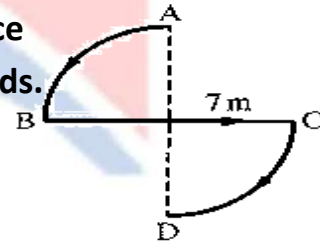


34. The opposite figure represents the motion of an object on the circumference of a circle with a radius of 25 cm. Find the magnitude of the displacement of the object as it moves.

- a) One complete rotation. b) Half a rotation. c) quarter rotation.



35. A car is moving in a circular path with a radius of 7 meters and a circumference of 44 meters from point (A) to point (D) through points (B) and (C) in 10 seconds. Prove that the average speed is greater than the car's velocity.



36. In a clock, if the length of the hand of seconds is 7 cm, Calculate the time taken by the tip of the hand of seconds to cover a displacement equals 14 cm.

37. If the angle between the incident light ray and the reflected ray on a plane mirror is 140° , what is the angle between the incident ray and the reflective surface?

38. A person 165 cm tall stood 3 meters away from a plane mirror and formed an image in the mirror. Answer the following:

- a) What are the properties of the image formed, and what is the distance between the image and the mirror?-----
- b) If the person moves 1 meter away from the mirror, what is the distance between the image formed and the first image?-----
- c) If the mirror is moved 2 meters in the direction of the person, calculate the distance between the image formed and the first image.-----

39. If the distance between a person and his image in a mirror is 12 metres, what is the distance required for the person to move so that the distance between the position of the new image and the old one is 4 metres?

40. Nashwa stood halfway between a plane mirror and a concave mirror, forming two equal images, one upright and one inverted.

A) In which of the two mirrors was the inverted image formed? -----

b) If the distance between the two mirrors is 200 cm, calculate:

1- The focal length of the concave mirror. -----

2- Nashwa's distance from her image in the plane mirror. -----

41. An object 6 cm long was placed 9 cm in front of a spherical mirror and formed an image on the barrier. The length of the image was equal to the length of the object.

a. What type of mirror is it? -----

b. Calculate the focal length of the mirror and its radius of curvature. -----

42. An object is placed 10 cm from a concave mirror with a focal length of 4 cm.

(a) Draw a diagram to show the path of the rays incident on the mirror and the path of the rays reflected from it. -----

(b) Mention the properties of the formed image. -----

43. An object is placed 12 cm away from a concave mirror with a radius of curvature of 16 cm.

a. Calculate the focal length of the mirror. -----

b. Draw the path of the rays forming the image of the object.

c. Mention the properties of the formed image. -----

44. An object placed 8 cm away from a spherical mirror with a radius of curvature of 16 cm did not form an image. When the mirror was moved 5 cm away from the object, it formed an image on the barrier:

a. What type of mirror? -----

b. Identify the location and characteristics of the image formed.

- 45.** An object is placed 10 cm away from a spherical mirror with a radius of curvature of 12 cm, and then the mirror is displaced 2 cm in the direction of the object to form an image. Locate and describe the image formed, explaining your answer with a drawing.

- 46.** A thin, hollow glass ball with a shiny outer surface and a diameter of 24 cm, a suitable part of which was cut into the shape of a mirror.

- a- What type of mirror is formed?
- b- Calculate the focal length of this mirror.
- c- What are the characteristics of the image formed by this mirror when the object is placed 12 cm away from its pole?

- 47.** A body whose length is 4 cm is at a distance of 6 cm from a convex lens whose focal length is 3 cm. Draw a diagram to show the path of the rays incident on the lens and the refracted ones from it, then state:

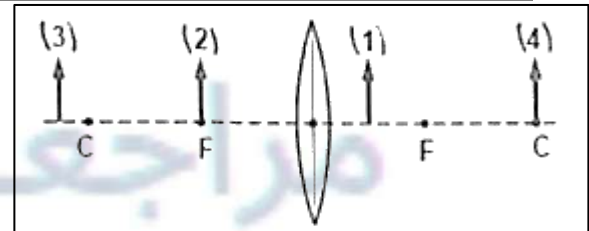
- (a) The properties of the image formed.
- (b) The length of the image.
- (c) The radius of curvature of the lens.
- (d) The position of the image.

- 48.** When an object is placed at a distance of 12 cm from the optical center of the convex lens, it forms a real, magnified and inverted image, and when it is placed at a distance of 14 cm, it forms a real, diminished and inverted image. What is the value of the possible focal length of this lens?

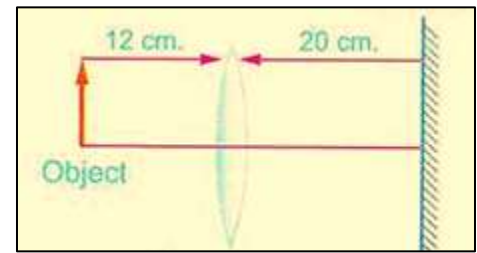
- 49.** From the opposite figure: In which of the positions (1) to (4) is it appropriate to position the object so that

- a) an upright, magnified, and virtual image of it is in the same direction as the object?

- b) No Image formed?



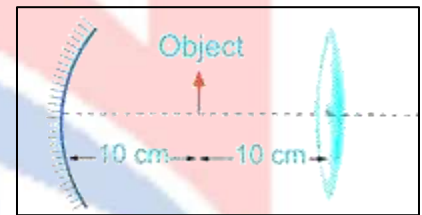
50. In the opposite figure, a convex lens formed an image of the object at its left side at a distance of 12 cm. This image is real, inverted, and equal to the object in front of a reflecting surface of a plane mirror that is 20 cm away from the lens.



Conclude each of the following:

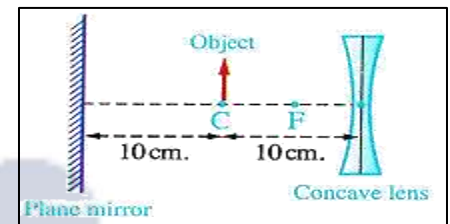
- (a) Focal length of the convex lens.
- (b) The distance between the object and the image formed by the plane mirror. Is the image formed by the plane mirror upright or inverted with respect to the object?

51. In the opposite figure, an object is placed between a convex lens with a focal length of 5 cm and a concave mirror with a focal length of 5 cm.



- (a) Find the distance between the image formed by the convex lens and the image formed by the concave mirror.
- (b) Mention the properties of the image formed by the concave mirror.

52. In the opposite figure, determine the ratio between the length of the image formed for the object by the plane mirror and that formed by the concave lens.



(greater than - smaller than - equal to) one?

With the reason?

.....

Question 12:

Find out the different word that does not fit the following:

- Mass of an object 100 kg - Its length 16 cm - It covers 50 m - By speed equals 120 m/s.
- $m/s - m \times s^{-1} - km/s - m \times s^2$. (.....)
- Total distance - Time - Relative speed - Average speed. (.....)
- Car its weight is 5000 N - It covers a road its length 120 Km - In a time 2 hours Degree of temperature $40^\circ C$. (.....)
- Used in solar ovens - Placed on the right and left sides of the car driver - Used in front lights of cars - Used in dentists clinics. (.....)

6. Concave mirror -Convex mirror- Plane mirror - Convex lens. (.....)
7. Concave lens - Convex lens - Virtual image - Erect magnified image. (.....)
8. Erect - Equal to the body - Reversed - Real. (.....)
9. Fertilized ovum - Gametes - Zygote - Liver cell. (.....)
10. Metaphase - Interphase - Prophase – Anaphase. (.....)
11. Testis - Ova - Ovary - Anther. (.....)
12. Crossing over phenomenon - Condensing of chromatin reticulum - Nucleolus disappear -Splitting of centromere. (.....)
13. Yeast - Paramecium - Sponge – Hydra. (.....)
14. Starfish - Sponge - Hydra - Human. (.....)

Question 13:Variant questions:

1. What is the simplest type of motion ?

.....

2. What is the name of the device in front of you and why is it important?

.....

3. Mention the importance of :

a) speed.

b) Space telescope.

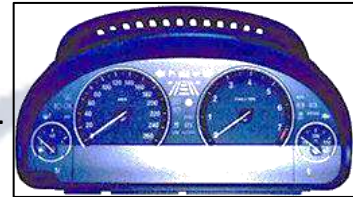
c) Microscope.

d) Light year.

e) Solar telescope.

f) Hubble telescope.

g) Gold nanoparticle.



- h) Chromosomes. . -----

- i) Sporangium. -----

- g) Vegetative reproduction.-----

- k) Sexual reproduction. -----

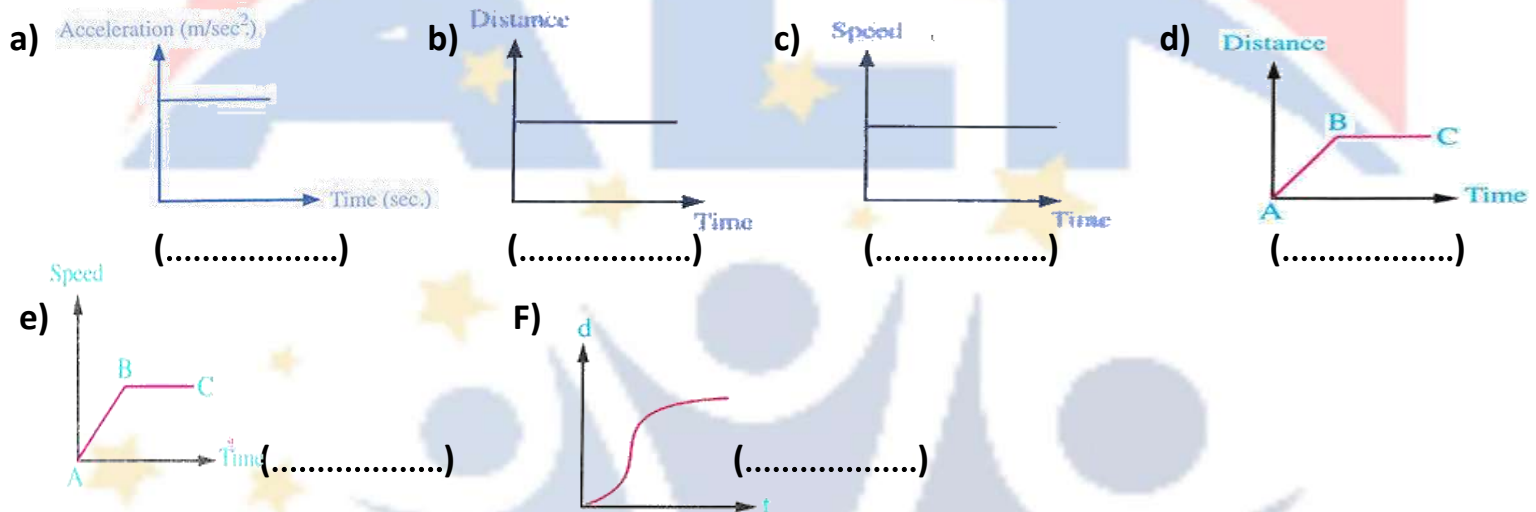
4. On recording the results of an experiment in which an object moves, the results were as follows:

Put a (✓) in front of the correct answer: This object moves at:

Distance (meter)	10	20	30
Time (second)	1	2	3

- 1- Uniform deceleration. 2- Uniform acceleration. 3- Uniform speed.

5. Describe the motion of the body in each of the following graphs:



6. When are the scalar physical quantities added and subtracted?

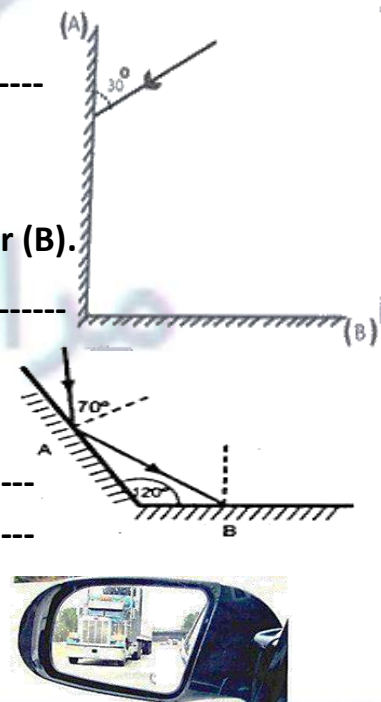
7. From the diagram opposite:

Complete the path of the reflected rays in the diagram shown.

Calculate the value of the angle of reflection of the light ray on the mirror (B).

8. From the opposite figure: Calculate the angle of reflection on the surface of mirror B.

9. From the figure opposite:



1- What type of mirror? -----

2- Identify some of its uses in our daily life? -----

10. Explain by drawing...?

a) The path of the rays formed by the sun through a concave mirror.

b) The path of the rays formed by an object placed 7 cm away from a concave mirror with a radius of curvature of 14 cm.

c) Place an object 8 cm in front of a convex lens with a focal length of 3 cm.

d) Place an object in front of a concave lens at a distance greater than its focal length and less than twice its focal length.

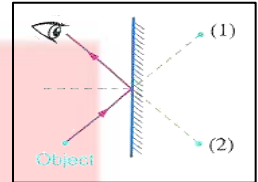
E) The formation of an image equal to the object by means of a convex lens.

h) Steps of crossing over.

i) Anaphase in meiosis I.

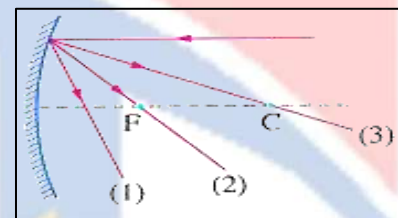
11. Study the opposite figure, then determine:

At which positions (1) or (2), does the image of the object appear? Give a reason.



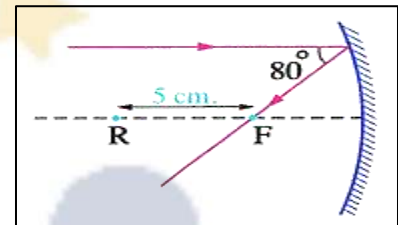
12. Study the following figure, then answer:

The reflected ray takes the path number.....



13. In the opposite figure, complete:

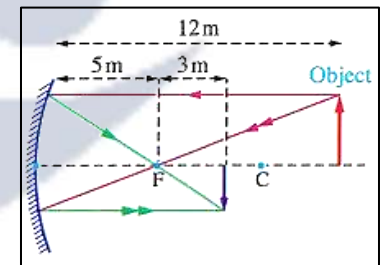
- The focal length equals.....
- The diameter of curvature of the mirror equals.....
- The angle of incidence equals.....



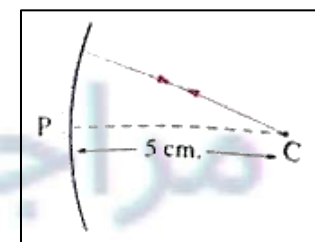
14. In the opposite figure:

a) Calculate the distance that the object moves towards the mirror in order to form a real, inverted, and equal image.

b) The distance the object must move so light rays are reflected parallel to each other = -----



15. In the opposite figure: on placing an object in front of the reflecting surface of the mirror at a distance of 6 cm from its pole, the ratio between the length of the image formed by the mirror to the length of the object is.....



16. If you have (concave mirror/convex lens/convex mirror/planar mirror/concave lens), which one can be used to obtain:

a) an inverted image equal to the object. -----

- b) Upright image that is smaller than the object. -----
- c) Virtual image equal to the object. -----
- d) A real magnified image. -----
- e) a virtual, upright, and enlarged image on the other side of the object, only if the object is placed at a distance less than its focal length. -----

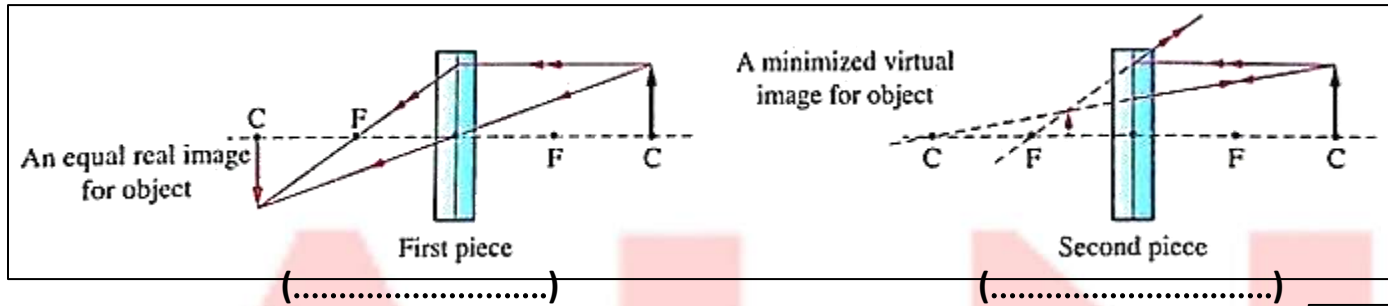
17. Explain each of the following by an experiment:

- a) The first law of light reflection.

- b) Determination of the focal length of the concave mirror.

- c) Show an activity for the determination of the focal length of the convex lens.

18. Study the following cases, then mention the name of each optical piece:

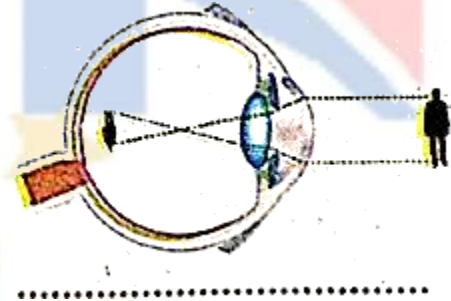
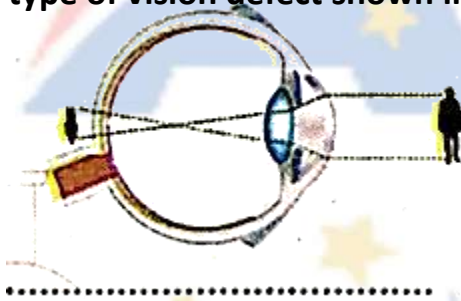


19. What material can contact lenses be made of? What are they used for?

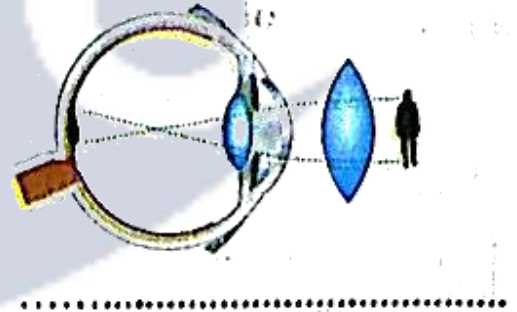
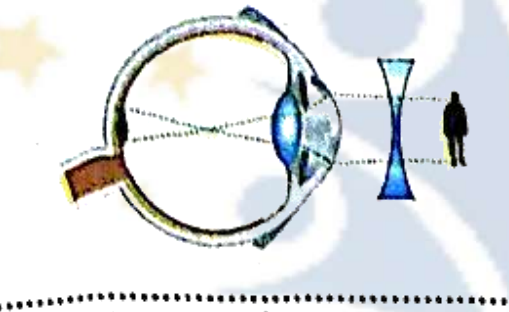


20. Study the following two diagrams carefully, and then identify:

a) the type of vision defect shown in the diagram:



b) the type of vision that has been corrected as shown in the diagram:

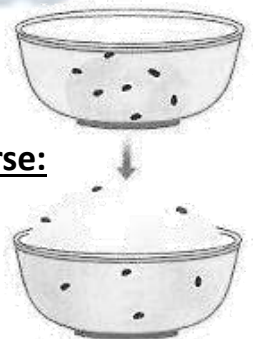


21. Mention the number which indicates:

- Number of galaxies in the universe. (.....)
- Number of spiral arms in the Milky Way galaxy. (.....)
- The distance covered by light through three light years. (.....)
- The Sun was born. (.....)

22. The opposite figure represents one of the processes that occurred in the universe:

- The rising of the dough?
- The spacing of the raisin grains?



23. According to the Big Bang theory, arrange the following events from oldest to newest:

- 1- The formation of the solar system. (.....)
- 2- The formation of the ancestors of galaxies. (.....)
- 3- The beginning of the first life on Earth. (.....)
- 4- The coalescence of matter to form larger masses. (.....)

24. Re-arrange the following events in the assumptions of nebular theory from oldest to latest:

- (a) The nebula gradually lost its heat, so its size contracted and its revolving speed increased. (.....)
- (b) The solar system originated from a glowing gaseous sphere rotating around itself. This sphere is called a "nebula". (.....)
- (c) The gaseous rings cooled down and froze, forming the planets of the solar system, and the flaming mass that remained in the center formed the "Sun". (.....)
- (d) The nebula lost its sphere shape and became a flat, rotating disk, with some parts separating to form gaseous rings. (.....)

25. Mention the assumptions of the modern theory for the origin of the solar system.

26. Mention the general structure of the chromosome, show your answer by drawing and label it.

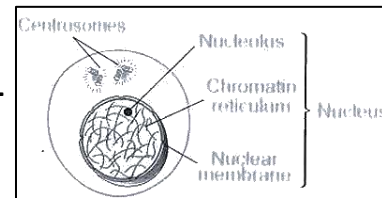
27. Two cells in a plant divide, one in the stem and the other in the ovary. Given that the number of chromosomes in each cell is 8 pairs, state:

- (a) The type of division that occurs in each cell. -----
- (b) The type of reproduction in plants. -----
- (c) The number of chromosomes in the cells resulting from each cell division. -----

28. Look at the following figure, then answer:

(a) What is the name of the phase represented by that figure?

(b) When does this phase occur?



29. Look at the opposite figure which represents one of the phases of the cell division:

a. What is the name of this phase?

b. What type of cell division does it belong to?

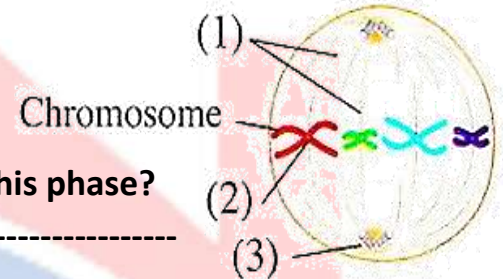
c. What happens to the two chromatids of each chromosome after this phase?

d. In which type of cell does such division occur?

e. Draw the diagram of the following phase.

f. How was the structure of number (1) formed?

g. Write the number which refers to the centromere.



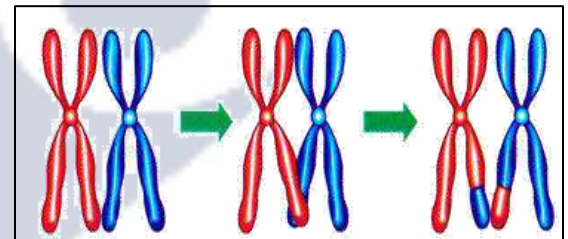
30. What are the steps that chromosomes go through for crossing over phenomenon to occur?

31. Note the following figure about crossing over phenomenon then answer:

1. **Complete:** It takes place between the two.....of each tetrad.

2. When does it occurs?

3. What is its importance?



32. From the opposite figure, answer the following:

a. What is the name of the division phase represented by this figure?

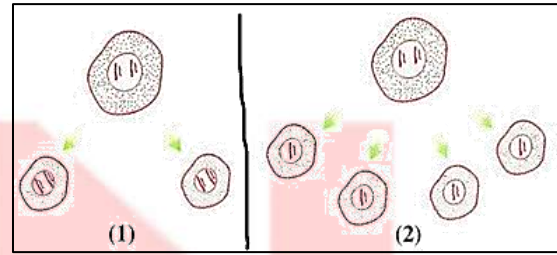
b. What is the most important phenomenon that occurs in it?



c. Draw the diagram of the phase next to this one.

33. The two opposite figures illustrate the division of two cells in two different ways:

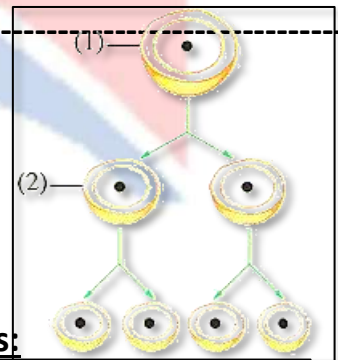
a) Mention the type of division that occurs in each of the two methods, explaining where they occur?



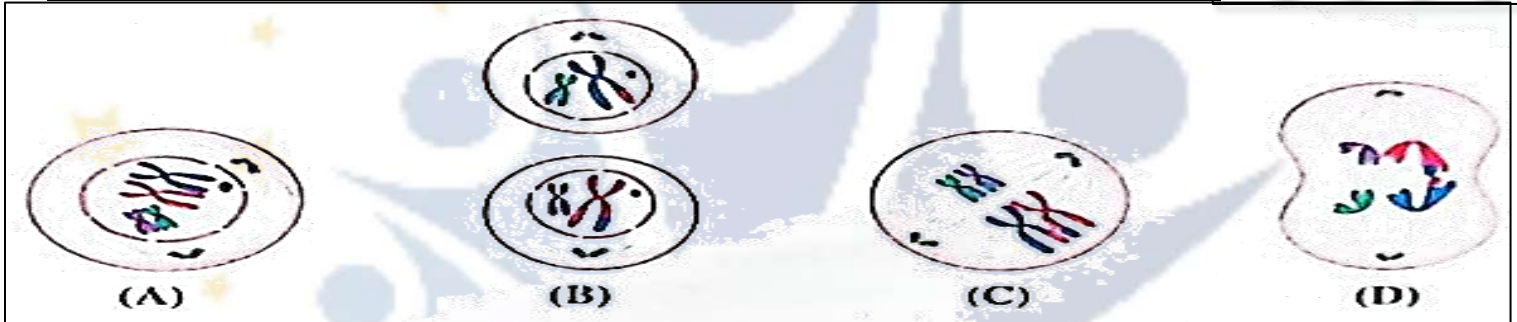
b) Mention the number of chromosomes in each cell resulting from the division in each of the two methods, knowing that the number of chromosomes in the mother cell is 20 chromosomes.

34. Study the opposite figure, then answer:

If the number of chromosomes in cell (1) is 16,
how many chromosomes are in cell (2)?.....



35. The following microscopic images illustrate the first meiotic division phases:



1. Identify each phase.-----

2. Arrange these phases according to the priority of occurrence.-----

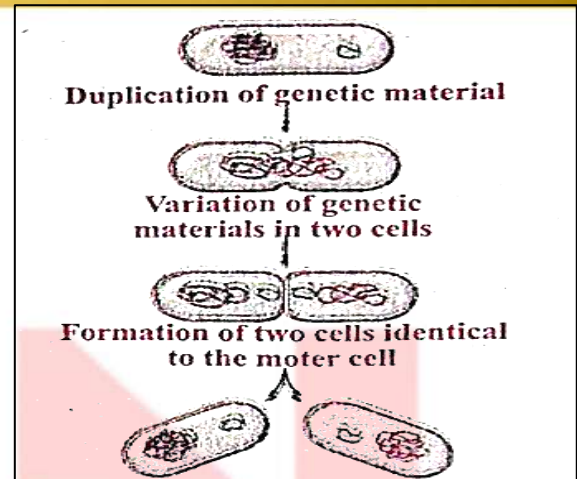
36. Explain: Miotic divisions differs from second meiotic division although they are similar in their phases.

37. - Note the following figure then answer:

-The opposite figure shows reproduction by.....

It occurs in some organisms such as.....,

simple algae and protozoa such as.....,.....,

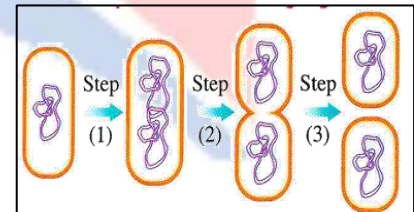
**38. The opposite figure represents one type of asexual reproduction in a living organism:**

a. Mention the steps of this type of asexual reproduction in this organism as shown in the figure in:

step (1) -----

step (2) -----

step (3) -----

**39. -Note the following figure then answer:**

-The figure illustrates reproduction by.....

-It occurs in unicellular organisms such as.....

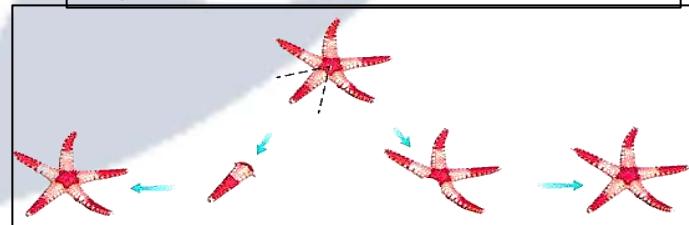
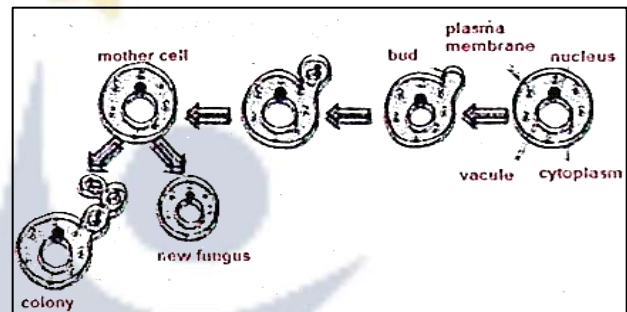
-It occurs in multicellular organisms such as.....

40. -Note the following figure then answer:

-The figure illustrates reproduction by.....

-When a starfish loses one of its arms, which contains part of the central disc, the process of occurs for

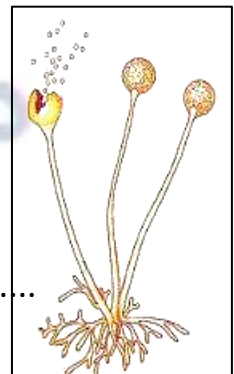
the starfish, and the process of occurs for the lost arm to form a new starfish.

**41. -Note the following figure then answer:**

-The figure shows reproduction byor.....

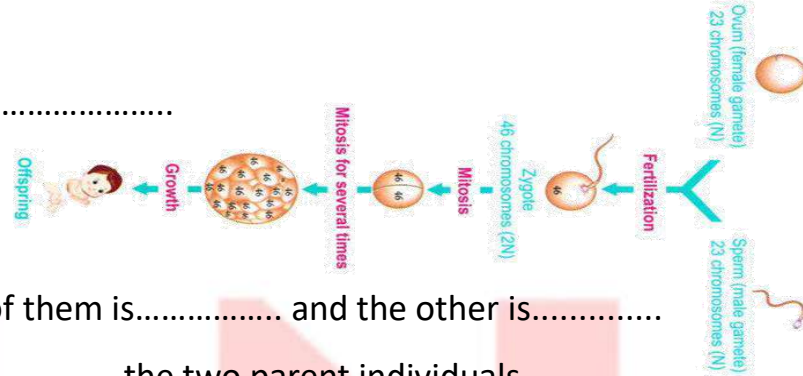
- This type of reproduction occurs in such as and

which contain special organs called and contain a large number of



42. Note the following figure, then answer:

- The opposite figure shows reproduction.....
- It depends on two basic processes, which are



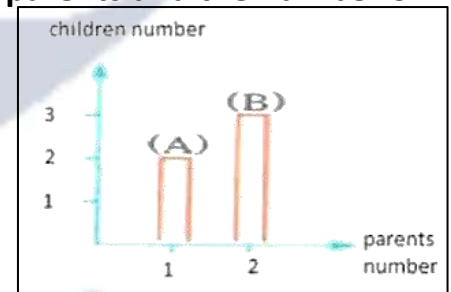
- It is carried out by two..... individuals, one of them is..... and the other is.....
- The resulting new individuals have genetic traitsthe two parent individuals.

43. What is the relationship between the genetic structure of the offspring and the parents in the following cases? Explain the reason in each case:

- 1- Binary fission in Paramecium.
- 2- Plant resulting from seed germination.

44. Explain with a diagram how gametes are formed from reproductive cells through meiotic division.**45. The opposite graph shows the relationship between the number of parents and the number of children for two cases of reproduction:**

What is the type of reproduction in each of the two cases A and B?

**46. A testicular wall cell in a human male underwent several divisions, resulting in 256 cells. In light of this, answer the following:**

- a- How many divisions occurred? And what type?.....
- b- How many chromosomes are in the total number of resulting cells?.....

Question 1:Choose the correct answer:

1. The speed of a car is 120 km/s.....The speed of a car is 40 m/s.

- a) Less than. b) Equal to. c) Greater than. d) Twice.

2. A uniform speed of 90 km/h is equal tom/s.

- a) 20. b) 25. c) 30. d) 35.

3. If the time it takes to travel a given distance quadruples, the speed.....

- a) Quadruples its value. b) Decrease by half. c) Decreases by a quarter. d) Doubles.

4. A student took 10 minutes to walk from home to school at an average speed of 2 m/s. Which of the following is the distance between his home and school.....?

- a) 4.8 m. b) 84 m. c) 1.2 Km. d) 3.6 Km.

5. If the value of speed is $V = \frac{d_1 + d_2 + d_3}{t_1 + t_2 + t_3}$, the resulting speed will be an (a)speed.

- a) average. b) increasing. c) zero. d) decreasing.

6. In a race in which a motorcycle makes 7 laps around a square stadium with a side length of 10 meters in a time of 10 seconds, the average speed of the motorcycle is

- a) 70 m/s. b) 28 m/s. c) 7 m/s. d) 32 m/s.

7. If a car and a bicycle move from the same place and in the same direction, and the speed of the car is 50 m/s and the speed of the bicycle is 10 m/s, then after 4 seconds the distance between them becomes meters.

- a) 100. b) 160. c) 200. d) 240.

8. The police were chasing a thief, and the thief was driving his car at a speed of 20 m/s. The police fired a bullet at the thief at a speed of 720 km/h. The relative velocity of the bullet, as estimated by the thief, is... km/h.

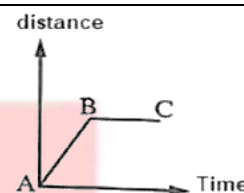
- a) 740. b) 255. c) 648. d) 800.

9. If $\bar{V} \neq V$, so the body is moving with.....speed.

- a) uniform. b) non-uniform. c) increasing. d) Decreasing.

10. In the opposite figure: The magnitude of the speed of the object in the interval (BC) is equal to the magnitude of in the interval (AB).

- a) Speed. b) Acceleration. c) Distance. d) Time.



11. When a moving object takes 2 seconds to reach a final speed of 5 times its initial speed, the magnitude of its acceleration is the magnitude of its initial velocity.

- a) one-half. b) Equals. c) Twice. d) Two and half time.

12. When a car starts its motion from rest, each of the following is true except

- a) Its speed gradually increases. c) It moves with increasing acceleration.
b) Its final speed is greater than its initial speed. d) Its initial speed is greater than its final speed.

13. When a car moves at a positive uniform acceleration of (10 m/sec^2) , this means that.....

- a) The car speed increases at a rate of 10 m/s every second.
b) The car speed decreases at a rate of 10 m/s every second.
c) The car covers 10 meters each second.
d) The car's acceleration increases at a rate of 10 m/s every second.

14. A body moves with uniform acceleration when.....

- a) its initial speed = its final speed. c) it covers equal distances in equal times.
b) its speed increases by equal amounts in equal times. d) its speed changes by equal amounts in equal times.

15. All of these are examples of scalar physical quantities except:

- a- Length and acceleration. b- Time and mass. c- Mass and speed. d- Time and speed.

16. If a person moves 8 meters towards the north, then 4 meters towards the east followed by 8 meters towards the south, his displacement is..... meters towards the west.

- a) 30. b) 12. c) 8. d) 4.

17. A person throws a tennis ball and it hits a wall 5 meters away and bounces into his hand and he catches it, the displacement =

- a) 10 meters. b) 5 meters. c) Zero. d) 7.5 meters.

18. A body traveling along a circular path makes one and a half turns, the radius of the circle is 12 metres, the magnitude of the displacement is..... metres.

- a) 12. b) 0. c) 24. d) 18.

19. Ahmed and Mohammed are moving with the same magnitude of speed in opposite directions, so they have the same

- a) velocity. b) displacement. c) scalar velocity. d) Relative speed.

20. A rubber ball is dropped from a height of 4 meters from the ground downwards, bounces up 2 metres, and then falls back down to land on the ground. The displacement =..... meters.

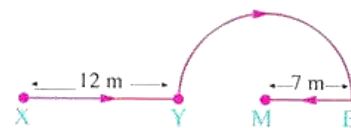
- a) 2. b) 6. c) 4. d) 8.

21. If Ahmed travels 3 meters east from his house to the cinema and his friend Mohammed travels 5 meters west from his house to the same cinema, the displacement from Ahmed's house to Mohammed's house is metres.

- a) 2. b) 3. c) 5. d) 8.

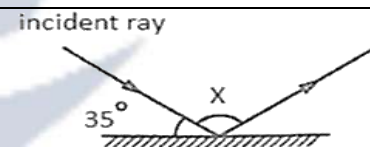
22. In the opposite figure, the object moves from point (X) to point (M) that represents the center of sphere passes through points (Y) and (E), so its displacement =.....

- a) 5m. b) 7m. c) 12m. d) 19m.



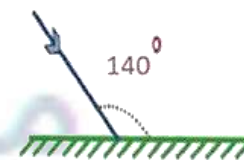
23. If a light ray falls on a plane mirror, as shown in the figure, then the value of the angle x is.....

- a) 35. b) 110. c) 55. d) 70.



24. From the opposite figure: We conclude that

- a) Angle of incidence = 70. b) Angle of reflection = 70.
c) The angle between the incident light ray and the reflecting surface = 50.
d) The angle between the incident light ray and the reflecting surface = 40.



25. A person put a pen in his left pocket and looked in a plane mirror. The pen appeared....

- a) To the left because it is reversed. c) To the right because it is reversed.
b) to the right because it is erect. d) to the left because it is virtual.

26. The following are properties of the image formed by plane mirrors, except.....

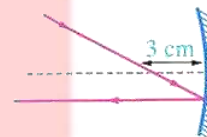
- a) upright. b) laterally inverted. c) Real. d) Equal to the body in size.

27. A body was put in front of a plane mirror at a distance of 4 metres, an image is formed behind the mirror. If the mirror moved towards the body one meter, the distance between the first image and the second image is a..... meter.

- a) 1. b) 3. c) 2. d) 4.

28. In the opposite figure: Radius of mirror curvature =cm.

- a) 3. b) 6. c) 9. d) 12.



29. A concave mirror formed an image of the moon at a distance of 15 cm from the mirror surface. What is the focal length?

- a) 30 cm. b) 5 cm. c) 15 cm. d) 60 cm.

30. An object is located 10 cm from a concave mirror, and an inverted true image of the object is formed. If the object moves toward the mirror at a distance of 3 cm, an image is formed.....

- a) real, inverted, and diminished. c) virtual and diminished.
b) real, inverted, and magnified. d) diminished and magnified.

31. A concave mirror has a radius of curvature = 50 cm. The object is placed at a distance..... until a virtual, up righted and magnified image is formed.

- a) 12 cm. b) 35 cm. c) 25 cm. d) 50 cm.

32. If an object is placed in front of a concave mirror with a focal length of 8 cm, its image is formed at a distance of 20 cm from the mirror. This means that the object is located at a distance ofcm from the mirror.

- a) 8. b) less than 8. c) 20. d) more than 8 & less than 20.

33. A spherical mirror forms a 5 cm real image of a 15 cm object placed at a distance of 20 cm from it. The possible focal length of this mirror is cm.

- a) 8. b) 15. c) 25. d) 80.

34. A concave mirror is placed in the path of the sun's rays, and a very diminished real image of the sun formed at a distance of 15 cm from the pole of the mirror. If the same concave mirror is used to obtain a real inverted image, the object must be placed at a distance of cm from its pole.

- a) 15. b) 10. c) 30. d) 40.

35. A person stood at a distance of 30 cm from a mirror and formed a real image with a length equal to $\frac{1}{5}$ of its length. What type of mirror is this person using?

- a) Plane mirror. b) Concave mirror. c) Convex mirror. d) cylindrical mirror.

36. Which of the following represents the light pieces that can form images equal to the object?

- a) Concave mirror, concave lens, plane mirror. c) Plane mirror and concave lens only.
b) Concave lens and convex mirror only. d) Convex lens, concave mirror, plane mirror.

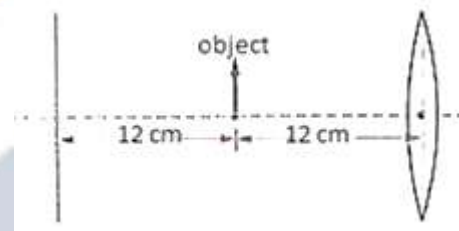
37. Which of the following is a use of lenses?

- a) Car headlights. b) Microscope. c) Dentist's lens. d) Solar heaters.

38. The focal length of the thickest lens =.....

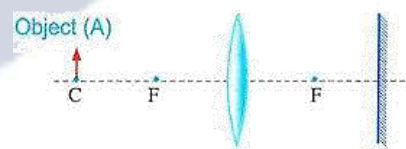
- a) 4 cm. b) 6 cm. c) 8 cm. d) 10 cm.

39. In the opposite figure, an object is placed in the middle of the distance between a convex lens with a focal length of 6 cm and a plane mirror. The distance between the image formed of the body by the convex lens and the image formed of the body by the plane mirror is..... cm



- a) 12. b) 24. c) 36. d) 48.

40. If you put an object (A) in the center of curvature of a convex lens, and a plane mirror in its center of curvature of the other side, so the image formed by the plane mirror with respect to the object (A) is.....



- a) upright and equal. c) inverted and equal.
b) upright and diminished. d) inverted and magnified.

41. A lens was placed in the path of the sun's rays, and a very small real image of the sun was formed at a distance of 15 cm from the optical center of the lens. If the same lens is used to obtain a virtual, magnified, upright image, the body must be placed at a distance of cm from its optical center.

- a) 12. b) 5. c) 15. d) 30.

42. A convex lens has a focal length = 50 cm. An object is placed at a distance of = 80 cm from a convex lens, and an image of it is formed at a distance of.....

- a) 30 cm. b) 50 cm. c) 100 cm. d) greater than 100 cm.

43. The ratio between the length of the object and the length of the image formed by the concave lens is

- a) Greater than one. b) Less than one. c) Equal to one. d) Equal to half.

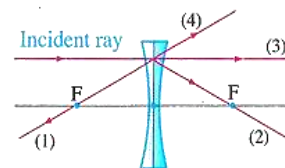
44. Which of the following is the term that describes the point at which light is focused by normal vision of eye?

- a) Retina. b) Lens. c) Eyeball. d) Cornea.

45. The causes of cataracts are all of the following except.....

- a) Genetic predisposition. c) Side effects of drug.
b) Old age. d) Increased convexity of the eye lens.

46. The light ray which completes the correct path of the incident light ray is.....



- a) (1) and (2) together. b) (2) only. c) (3) and (4) together. d) (4) only.

47. Which of the following represents the correct order in the universe.....

- a) Galaxy → Universe → Solar System → Earth. c) Earth → Solar System → Universe → Galaxy.
b) Universe → Galaxy → Solar System → Earth. d) Solar System → Earth → Galaxy → Universe.

48. Recent discoveries in the science of..... have enabled scientists to trace the history of the universe.

- a) Physics and Chemistry. c) Biology and Physics.
b) Chemistry and Biology. d) Physics and Astronomy.

49. The two gases which produced the galaxies, stars and the universe among millions of years are.....

- a) Oxygen and Helium. c) Hydrogen and Helium.
b) Oxygen and carbon dioxide. d) Hydrogen and Carbon dioxide.

50. According to the Big Bang theory, within minutes of the creation of the universe, the ratio between hydrogen and helium gases, respectively, was.....

- a) 1:2. b) 2:2. **c) 3:1.** d) 1:3.

51. The appearance of the first (Earliest or primitive) life on the earth was after..... million years from the massive explosion.

- a) 3000. **b) 12000.** c) 15000. **d) 178000.**

52. The solar system lies in a.....Arm of the Milky Way galaxy.

- a) Straight. **b) Spiral.** c) Circular. d) Cylindrical.

53. Published a research with title "World System" and in-The scientist cludes his imaging about nebula forming the solar system.

- a) Chamberlain. **b) Laplace.** c) Molten. **d) Fred Hoyle.**

54. Laplace was influenced when he put the nebula theory into shape by the shape of aplanet in space.

- a) Earth. b) Mercury. **c) Saturn.** d) Mars.

55. The sun escaped from the gravity of the crossing star due to the force of.....

- a) Gravity. b) Centrifugation. **c) Explosion.** d) Heat.

56. After the bombed gases were cooled as a result of the explosion of a star.....

- a) Life forms begin to appear on its surface. c) The size of the star decreases.
b) Gas particles gather to form solid particles. **d) The star returns to its previous shining.**

57. The Hubble telescope was launched in April.....

- a) 1905. **b) 1990.** c) 1995. **d) 1959.**

58. A chromosome consists of..... chromatid before cell division.

- a) 6. **b) 1.** c) 3. **d) 4.**

59. If an ovum of a species contains 3 chromosomes, so its liver cell when divided, each one of the new resulting cells will contain.....

- a) 3 chromatids. b) 3 pairs of chromatids. c) 6 chromatids. **d) 6 pairs of chromatids.**

60. If the number of chromosomes in a human pancreas cell is 23 pairs of chromosomes What is the number of chromosomes in a skin cell?

- a) 23. b) 11.5 **c) 46.** d) 11.

61. The number of chromosomes in a pollen grain is..... The number of chromosomes in a female egg.

- a) Half. b) Double. **c) Equal.** d) Quarter.

62. The number of chromosomes resulting from meiosis is symbolized by the symbol.....

- a) N.** b) 2N. c) $1\frac{1}{2} N$. d) N².

63. The genes of individuals of the same species differ due to the occurrence of.....

- a) Mitosis. **b) Crossing over phenomenon.** c) Interphase. d) Aurora phenomenon.

64.Follows the same steps of mitosis.

- a) Zygote. **b) Meiosis II.** c) Meiosis I. d) Cell division.

65. Mitosis is necessary for unicellular organisms to.....

- a) tissue formation. b) Growth in size. **c) Reproduction.** d) Regeneration.

66. Spore reproduction occurs in the following organisms except.....

- a) Starfish.** b) Algae. c) Bread mold. d) Mushrooms.

67. New plants that look exactly like the parent plant can be produced by.....

- a) Gamete formation. b) The occurrence of fertilization. c) Binary fission. **d) Tissue culture.**

68. A small sperm and a large egg share the genetic material and traits of a child in a crop of.....

a) 2:1

b) 1:1

c) 1:2

d) 1:4

69. All of the following cells contain the entire organism's genetic material except.....

a) zygote.

b) pollen grain.

c) Bud.

d) germ.

70. Asexual reproduction produces offspring..... to the parents and therefore minimizes.....

a) Genetically non-identical, genetic expression.

c) Almost identical, genetic mutations.

b) Genetically identical, genetic variation.

d) Partially identical, genetic similarity.

Question 2:

Put (✓) or (×):

1. When an object moves at a regular speed, its average speed is more than its regular speed.	(×)
2. When the object position changes as time passes, the object is moved during this period.	(✓)
3. When a cheetah whose speed is (27 m/sec.) races with a car that has a speed of (90 km/h), the cheetah precedes (overcomes) the car in this race.	(✓)
4. (Distance - time) graph by a horizontal line parallel to the time axis expresses an acceleration of zero.	(✓)
5. The speed units are equivalent to the acceleration units.	(×)
6. When an object moves at a constant speed, the acceleration is uniform.	(×)
7. If the object starts its motion from rest, its initial speed is zero.	(✓)
8. If a cyclist travels 700 m east and then 900 m west, the amount of the displacement is 1600 m east.	(×)
9. If the object returns to its starting position, the distance is equal to the amount of displacement.	(×)
10. Dentists use a concave mirror during medical examinations.	(✓)

11. If the distance between the two centers of curvature of a lens is 16 cm, then its focal length equals 8 cm.	(☐)
12. The focus is a virtual point in the middle of the lens and principle axis passes through it.	(☐)
13. The person who fixes the watches uses the lenses.	(☒)
14. The universe contains various galaxies that move away from each other.	(☒)
15. The solar system contains many galaxies.	(☐)
16. Each group of stars is gathered in the solar system.	(☐)
17. The solar system belongs to the Andromeda galaxy.	(☐)
18. Galaxies emerged from the Big Bang.	(☐)
19. Galaxies started to be formed after about 1000 million years from Big Bang.	(☐)
20. The ancestors of galaxies are formed after 5000 million years from Big Bang.	(☐)
21. The two scientists Chamberlain and Molten put the crossing star theory to explain the origin of the universe.	(☐)
22. The crossing star is the largest star that can be seen from the surface of Earth.	(☐)
23. From assumptions of crossing star presence of another star that was revolving near the sun.	(☐)
24. The solar telescope revolves in an orbit around the Earth at a height of about 500 km.	(☐)
25. The chromatin reticulum (genetic material) condenses and appears as long, thin, double threads (chromosomes) in the final phase of mitosis.	(☐)
26. Gametes in living organisms are formed from cells known as somatic cells during meiosis.	(☐)
27. The centromere splits longitudinally into two halves during the first anaphase of meiosis.	(☐)
28. Meiosis results in the formation of two cells, each containing half the genetic material of the parental cell.	(☐)
29. The changes that occur in the final phase of meiosis are called retrograde changes.	(☒)

30. Asexual reproduction produces individuals with identical genetic structure.

(✓)

31. Some plants reproduce vegetatively by seeds.

(✕)

Question 3:

Correct the following underlined words:

1. From speed measuring units are <u>meter/second</u> ² or kilometer/hour.	(meter/second)
2. If the observer is stationary, the relative speed is <u>greater than</u> the actual speed.	(qual to)
3. The ratio between the final speed and the initial speed of an object with positive acceleration is <u>equal to</u> one.	(greater than)
4. When an object moves with zero acceleration, it means that the speed of the object is <u>increasing</u> .	(uniform, regular)
5. A moving car whose speed changes from 20 m/s to 30 m/s in two seconds has an acceleration of <u>10 m/s</u> ² .	(5 m/s ²)
6. To understand many physical phenomena, use <u>acceleration</u> between different variables to describe a specific phenomenon.	(Mathematical relations)
7. The distance covered by a body moving at a regular speed is <u>inversely</u> proportional to the time needed to cover this distance.	(directly)
8. The acceleration is the value of the <u>speed</u> of an object in one second.	(the change in speed)
9. Acceleration is <u>constant</u> if the object's speed increases by time.	(positive)
10. Displacement is characterized by two properties: magnitude and <u>time</u> .	(direction)
11. An object is moving in a circular path of radius r & covers a distance of πr will have a displacement of = <u>2 πr</u> .	(2 r)
12. A body moves in a circular path during half a cycle, then the ratio between its displacement and its distance is equal to <u>5\9</u> .	(7\11 or 2\pi)
13. A person moves 70 m northward then returns 40 m southward, so his displacement is <u>110 m eastward</u> .	(30 m northward)
14. The displacement caused by an object during a unit of time is called <u>non uni-form velocity</u> .	(average velocity)

15. The measurement unit of the quantity resulting from dividing the displacement by the time is <u>m/sec²</u> .	(m/sec)
16. When an aircraft moves against the direction of the wind, the aircraft's velocity <u>increases</u> .	(decreases)
17. Pilots take into account the <u>uniform speed</u> of the wind when flying.	(velocity)
18. Light rays are <u>passing</u> when falling on the reflected surface.	(reflects)
19. The image of the object that is formed by the <u>converging mirror</u> is always virtual and equal to the object.	(plane mirror)
20. The word ambulance is written on ambulance cars as <u>laterally corrected</u> .	(laterally inverted)
21. The distance between the object and a plane mirror is <u>more than</u> the distance between the plane mirror and the object's image.	(equal to)
22. The <u>focus</u> is a point inside the lens, the principal axis passing through it.	(optical centre)
23. The focal length of the mirror = <u>2</u> x the radius of curvature of the mirror.	(1\2)
24. The <u>plane</u> mirror is placed to the right and left sides of the car's driver.	(convex)
25. A light ray incident parallel to the main axis of a convex lens is refracted passing through <u>optical center</u> .	(focus point)
26. If an object is placed in front of a convex lens at <u>the focal point</u> , it forms a real inverted minimized image.	(the distance double to the focal length)
27. The focal point of a concave lens is always <u>real</u> .	(virtual)
28. The image of the object is formed <u>behind</u> the retina of a near-sighted person.	(in front of or before)
29. The lens is a transparent medium that <u>reflects</u> the light and is defined with two spherical surfaces.	(refracts)
30. The contact lenses can stick to the <u>eye pupil</u> , and can be removed easily.	(eye cornea)
31. The older stars gather in the <u>edges</u> of the galaxy.	(centre)

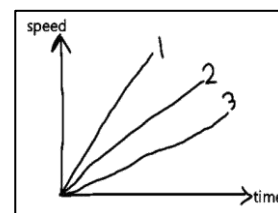
32. The Milky Way Galaxy takes its discoid shape after <u>3000</u> million years from the massive explosion.	(5000)
33. The earth revolves in a fixed orbit around the sun by the effect of the gravity of the <u>earth</u> .	(sun)
34. Big bang theory was placed to explain the origin of <u>solar system</u> .	(universe)
35. Many scientists believe that the universe emerged from a massive explosion called the Big Bang <u>500,000 years</u> ago.	(15000 millions years)
36. Sudden violent <u>chemical</u> reactions occur within the star which led to its explosion.	(nuclear)
37. Spindle fibers in plant cells form from the <u>centrosome</u> .	(Condensing the cytoplasm)
38. When a somatic cell divides three consecutive times, it produces <u>six</u> cells containing the same genetic material as the original cell.	(eight)
39. The nuclei disappear during the mitosis cell division in <u>telophase</u> .	(prophase)
40. The number of cells produced at the end of meiosis is <u>one-quarter</u> of the number of cells in mitosis.	(double)
41. Somatic cells divide <u>meiotically</u> , resulting in the growth of the organism.	(mitotically)
42. Reproduction occurs by <u>regeneration</u> in bacteria and algae.	(Binary fission)
43. The parental organism disappears when reproduction occurs by <u>budding</u> .	(Binary fission)

Question 4:

Complete the following statement:

- If an object changes position over time, it is said to be in a state of motion, while if it stays in the same position, it is said to be at rest.
- The motion of the train represents motion a straight line in one direction.
- The path of motion in one direction may be straight or curved or both.
- The two factors that can describe the motion of an object are distance and time.
- The speed of a moving object increases as decreasing the time taken to cover the fixed distance.
- If the uniform speed of a car is 90 km/h, it means that its speed = 25 m/s.
- Speed regular (uniform) of an object is difficult to achieve in practice.
- The movement of a car on the road is described as moving at irregular (non-uniform) speed.

9. Cars and aeroplanes are usually equipped with a set of gauges such as a fuel meter and a speedometer.
10. From the terms that are used to determine the amount of irregular speed, average speed, and relative speed.
11. Average speed is the regular speed by which an object moves to cover the same distance in the same time it takes to cover that distance.
12. A stationary object is an object whose fixed its position relative to a fixed point over time.
13. The value of the relative speed of a moving object varies depending on observer's position.
14. If the direction of the observer is opposite the direction of the moving object, so the relative speed is greater than actual (real) speed.
15. If two objects move in the same direction at the same speed, they appear to each other as Static.
16. The relative speed of an object moving faster than an observer moving in the same direction is equal to difference between the real speed of the moving object and the observer's speed.
17. When a car is traveling at 80 km/h in a certain direction, an observer in a car traveling in the same direction at a speed of 60 Km\h estimates its speed by 20 km/h.
18. If the actual speed of a car is 70 km/h and its relative speed to an observer is 20 km/h. The observer's condition is moving in the same direction and the observer's speed equals 50 Km\h.
19. Physicists use mathematical relationships between different variables to understand and describe phenomena.
20. The distance-time graph of uniform motion is represented by a straight line passing through the origin.
21. The motion of an object with uniform speed is represented (speed -time graph) by a straight line parallel to the time axis.
22. The rate of change of distance is speed, while the rate of change of speed is acceleration.
23. If the body moves from rest at a uniform acceleration, so its final speed is determined from the relationship $a \times \Delta t$.
24. A truck moves along a horizontal road at a uniform speed of 16 m/s for 4 seconds, so the acceleration of motion during this period of time equals zero.
25. The graph showing the uniform acceleration of a moving object has acceleration on the vertical axis and time on the horizontal axis.
26. The line 1 represents the motion of the greatest uniform acceleration (+a).
27. Physical quantities are divided into scalar and vector.



28. The displacement of the body through an interval time does not depend on the distance but depends on the starting and ending points.
29. The speed of predator (cheetah) is about 27 m/s.
30. The velocity represents displacement per second.
31. The product of the velocity of the body $\times$ time = displacement.
32. The velocity agrees with the displacement in direction and differs from it at measuring units.
33. The movement of wind arises from the difference of air pressure, while its direction is affected by the movement of earth around itself.
34. When the direction of the plane is opposite to the direction of the wind, the plane velocity decreases and each of time of trip, amount of fuel consumed increases.
35. Light is reflected when it falls on the reflecting (smooth, shiny) surface.
36. The angle between the incident light ray and the normal to the point of incidence is called the incident angle.
37. Types of mirrors include plane mirrors and spherical mirrors.
38. Spherical mirrors are of two types: concave mirror and convex mirror.
39. The stainless steel spoon is considered as an example of the spherical mirror.
40. The point that is in the middle of the reflective surface of the concave mirror is called the pole.
41. The secondary axis of a mirror is any straight line passing through the centre of mirror curvature and any point on its surface except the pole.
42. A convex mirror is always form a virtual image, minimized and erect.
43. The center of curvature of a concave mirror is located in front of its reflecting surface, while in a convex mirror is located in behind its reflective surface.
44. The radius of curvature of a concave mirror is equal to double its focal length.
45. The real focus of a spherical mirror is located midway between the pole and the focus point.
46. An incident light ray passing through the focal point of a concave mirror is reflected parallel to the principal axis, while a light ray incident parallel to the principal axis of a concave mirror is reflected passing through the focal point.
47. A light ray incident on a concave mirror passing through its center of curvature is reflected by an angle equal to zero.
48. The image formed by plane Or convex mirror must be virtual.
49. In ancient times, the scientist Archimedes was able to burn the sails of the Roman fleet by using concave mirrors.

50. The real image is always inverted and the virtual image is always upright.
51. The properties of images formed by a Concave mirror depend on position of object.
52. Real image is not formed by concave lenses, convex mirrors and plane mirrors.
53. A convex lens with a diameter of 30 cm has a focal length of 7.5 cm.
54. A convex lens with a distance between its focal point and its optical center of 10 cm has twice the focal length (r) 20 cm.
55. The normal person can see the near objects clearly at a distance not less than 25 cm and far objects at a distance up to 6 m.
56. The vision defect which is due to a shortness in the radius of the ball is called long-sightedness.
57. Land surveyors and topographical Scientists can determine the heights and the distances by calculating the time of travel of a beam of laser rays.
58. From the Discoid shape galaxy is milky way galaxy.
59. The solar system consists of one star and 8 planets revolves around it.
60. As the distant between the planet and the sun increased, the gravity decreased and the motion of the planet became slower.
61. The moons revolve around the planets, and the planets revolve around the sun, and the sun and planets revolve around the centre of Milky Way galaxy.
62. The sun is formed after 10,000 million years from Big Bang.
63. The scientists believe that the universe emerged from a massive explosion and it is in space continuous expansion and changing processes till now.
64. In the theory of big bang, it is thought that the universe originates from the great explosion since 15000 million years Originate in it the matter and energy and time and followed by continuous expansion and change.
65. According to modern theory, the gaseous cloud was subjected to cooling and contraction processes forming the matter of planets.
66. The nucleus of cell contains genetic (heradity) materials which is called chromosomes.
67. The chromosome consists of 2 chromatids connected together at centromere.
68. The chromosome chemically consists of DNA and protein.
69. The number of chromosomes is constant in the individuals of the same species.
70. The gamete has a number of chromosomes equal to half the number in the original cell.
71. Chromosomes appear in interphase in the form of thin network filaments called chromatin reticulum (nuclear network).

72. Miotic division aims to form gametes, while mitotic division aims to grow organisms.
73. Mitosis division begins with the prophase phase and ends with the telophase phase.
74. During prophase chromatin reticulum intensifies, and chromosomes appear in the form of thin strings.
75. During metaphase chromosomes are directed to the equator of the cell.
76. Spindle fiber threads are formed during cell division in the prophase phase, shrink in anaphase phase and disappear in the telophase phase.
77. Spindle fiber threads in animal cells are formed by centromere while in plant cells they are formed by condensing the cytoplasm.
78. Some somatic cells in humans never divide, such as adult red blood cells and neural cells, while some divide under special conditions, such as liver cells.
79. The liver's ability to divide under certain conditions represents the scientific basis for the process of Liver transplantation process.
80. Meiosis occurs in the anther of a flower to form pollen grains.
81. The Egyptian scientist, Dr. Mustafa El Said, was able to detect and kill cancer cells using technology.
82. Nano-gold Particles are used to detect infected cells when laser rays are directed to destroy them.
83. Sexual reproduction depends on two basic processes: gametes formation (meiotic division) and fertilization.
84. When the male gamete fuses with the female gamete zygote (fertilized ovum) is formed, which contains a diploid (complete) number (2N) of chromosomes.
85. Sexual reproduction is a source of genetic variation due to the occurrence of the crossing-over phenomenon during division.
86. When the zygote grows by mitotic division, it produces a new individual that combines the genetic characteristics of both parents.

Question 5:

Write the scientific term:

1. An object whose position does not change over time.	(<u>static object</u>)
2. The change of the position of an object relative to the position of another stationary object changes over time.	(<u>motion</u>)

3. -The distance traveled by the object in a unit of time. -The rate of change of distance.	(<u>speed</u>)
4. -The product of the speed of a moving object multiplied by time. -The product of half the magnitude of the speed of the moving object times twice the magnitude of the time in which it moves.	(<u>distance</u>)
5. Motion in which the average speed of the object is equal to the uniform speed.	(<u>uniform or regular motion</u>)
6. The thing which moves by constant velocity in the space even the surrounding conditions are changed.	(<u>light</u>)
7. The motion in which the speed of a moving object changes over time.	(<u>accelerating motion</u>)
8. -The amount of change in the object's speed per second. -The rate of change in speed. - A vector quantity, its measuring unit is m/sec. Each second.	(<u>acceleration</u>)
9. The acceleration at which an object moves when its speed changes by equal amounts in equal times.	(<u>uniform acceleration</u>)
10. The length of the actual path covered by the moving body from the starting position to the ending position.	(<u>distance</u>)
11. The distance traveled in a straight line in a constant direction.	(<u>displacement</u>)
12. The length of the shortest straight line between two positions.	(<u>the amount of displacement</u>)
13. -The rate of change in displacement. -The magnitude of the displacement over a unit of time.	(<u>velocity</u>)
14. -The fastest land animals. - The predator wild animal that its velocity is represented by determining the direction of its motion.	(<u>cheetah</u>)
15. They are reflective surfaces for light.	(<u>mirrors</u>)
16. Perpendicular line to the reflecting surface.	(<u>normal</u>)
17. Intersection Point between incident ray, reflected ray and the normal.	(<u>incidence point</u>)
18. Angle of incidence = angle of reflection.	(<u>the first law of reflection</u>)

19. The incident light ray and the reflected light ray and the normal line all lie in one plane perpendicular to the reflective surface.	(<u>the second law of reflection</u>)
20. -A transparent medium that refracts the light. -A transparent medium that refracts the light and is defined by two spherical surfaces; it is usually made of clear glass or transparent plastic.	(<u>lenses</u>)
21. The point of convergence or extension of refracted rays that falls parallel to the principal axis.	(<u>focus point</u>)
22. -A lens that forms a moderately magnified (virtual) image that is always reduced in size. - A lens that forms a virtual, erect image and always diminished.	(<u>concave lens</u>)
23. A disease that affects the lens of the eye and makes it opaque.	(<u>cataract</u>)
24. The distance between the lens of the eye and the retina.	(<u>diameter of the eye ball</u>)
25. Space which contains galaxies, stars, planets, and living organisms.	(<u>universe or cosmic space</u>)
26. Group of stars has a definite arrangement and coordination.	(<u>galaxies</u>)
27. A Medium-sized body that radiates light and heat.	(<u>star</u>)
28. Contains all the stars that you can see in the sky.	(<u>milky way galaxy</u>)
29. Lies in one of the spiral arms of the Milky Way galaxy.	(<u>solar system</u>)
30. One of the biggest stars that people on Earth can see.	(<u>the sun</u>)
31. The force that preserves the continuity of planets revolving in their orbits.	(<u>gravity</u>)
32. Theory that assumed the solar system originated from a glowing gas ball revolving around itself.	(<u>nebular theory</u>)
33. A giant star that attracted the sun, then the solar system was formed.	(<u>crossing star</u>)
34. The short time glow of a star to become one of the brightest stars in the sky, then its glow gradually disappears.	(<u>star explosion</u>)
35. The part in the cell which is responsible for cellular division.	(<u>nucleus</u>)

36. - The phase in which the cell prepares for division by duplicating its genetic material. - A phase where some processes occur upon which the formation of chromosomes that equal in numbers with the parental cell take place.	(<u>interphase</u>)
37. A stage of cell division in which the nuclear membrane and nucleolus disappear and the chromosomes become clear.	(<u>prophase</u>)
38. - A network of filaments that extends between the two poles of the cell during prophase. - The part responsible for pulling the chromosomes toward the two poles of the cell during anaphase.	(<u>spindle fibers</u>)
39. The phase in which the chromosomes are arranged in the middle of the cell during cell division.	(<u>Metaphase</u>)
40. Cells produced by meiosis contain half the number of chromosomes.	(<u>gametes</u>)
41. The process of exchanging pieces of internal chromatids in the tetrad.	(<u>crossing over phenomenon</u>)
42. The phase in which the chromosome pairs line up on the equator in the center of the cell.	(<u>metaphase I</u>)
43. A phase in which each pair of homologous chromosomes separate from each other without the centromeres dividing, and they move toward the opposite poles of the cell.	(<u>anaphase I</u>)
44. A dangerous disease occurs when some of the body cells are divided continuously without control.	(<u>cancer</u>)
45. Cell masses resulting from the continuous, abnormal division of living cells.	(<u>tumor</u>)
46. A biological process in which an organism produces new individuals of the same species.	(<u>reproduction</u>)
47. A structure emerges as a lateral bulge from the mother's cell and contains a nucleus.	(<u>bud</u>)
48. Specialized cells for producing gametes.	(<u>reproductive or sex cells</u>)
49. - Contains genetic material from both parents and, upon growth, produces new offspring that combine traits from both parents.	(<u>zygote</u>)

- It is resulted from the combination of a male gamete and a female gamete and contains the diploid number of chromosomes (2N) of the living organism.
- It is a cell produced due to fertilization and it contains the complete number of chromosomes of the living organism.

Question 6:What is meant by (Define) the following:**1.** An aero plane moving at a speed of 1200 km/s?

- (This means that the aero plane covers a distance of 1200 km in one second.)

2. The speed of an object is zero.

- (This means that the object is at rest.)

3. Uniform speed.

(It is the speed at which the object covers equal distances at equal periods of time.)

4. A car traveling at a uniform speed of 80 km/h.

(This means that the car covers a distance of 80 km each hour.)

5. An object moving in a straight line and covering a distance of 20 meters every (each) second.

(This means that the object moves at a regular speed equals 20 m/sec.)

6. The average speed of a car is 50 km/h?

(This means that the total distance covered by the moving car divided by the total time taken to cover this distance = 50 km/h.)

7. Relative speed

- (It is the speed of a moving object relative to a constant or a moving observer.)

8. The relative speed of a car relative to a moving observer is zero.

- (This means that the observer moves with the same speed of the car and in the same direction.)

9. The ratio d/t of a moving body is constant.

(This means that the object moves with the regular speed.)

10. The slope of the straight line in graphic relationship (distance-time) of a moving body equals 30 m/sec. (this means that the body moves by regular speed equal 30 m/s.)**11.** An object moving with a uniform acceleration has a positive value of 3 m/s^2 .

(This means that the body speed increases by 3 m/sec. each one second.)

12. An object has a negative uniform acceleration of 2 m/s^2 .

- (This means that the body speed decreases by 2 m/sec . each one second.)

13. The displacement of an object is 50 meters east.

- (This means that the distance covered in the east direction from the primary position of movement towards its final position equals 50 metres.)

14. The distance traveled by an object in an easterly direction is 30 metres.

(This means that the displacement of the object equals 30 m in the east direction.)

15. The length of the shortest straight line between the two positions of an object's motion is 5 metres.

- (- This means that the amount of displacement equals 5 m.)

16. Reflection of light.

- (It is the phenomenon of the light bouncing off (returning back) in the same medium, when it meets the reflecting surface.)

17. The plane mirror.

- (it is a piece of plane glass, painted from behind with a thin layer of silver metal to give the glass a bright surface that reflects the incident light rays that fall on it.)

18. Angle of reflection = 30° .

- (This means that the angle between the reflected light ray and the normal equals 30° .)

19. The angle between the incident light ray and the reflected light ray = 100°

- (This means that the angle of reflection and the angle of incidence = 50° .)

20. Spherical mirror.

- (It is a mirror that reflects its surface is a part of a hollow sphere.)

21. Radius of curve of the mirror = 10 cm.

- (*This means that the radius of the sphere of which the mirror is a part is 10 cm.
- *The distance between the center of the mirror's curvature and any point on its surface is 10 cm.
- *The focal length of this converting mirror is 5 cm.)

22. The real focus of the mirror.

- (It is the point of collection of the reflected light rays in the concave mirror.)

23. Optical center of Lens.

- (It is a point inside the lens that lies on the principal axis, in the mid-distance between its two faces.)

24. Principal axis of the lens.

- (It is the straight line that joins the two centers of curvature of the lens passing by the optical center of the lens.)

25. A concave lens has a radius of curvature of its face = 15 cm.

- (This means that the half of the diameter of the sphere, where this face is a part of is 15 cm.)
- (This means that the focal length = 7.5 cm)

26. Clusters of galaxies.

- (They are groups of galaxies that rotate together in cosmic space by the effect of gravity.)

27. Expansion of the Universe.

- (It is the continuous separation between galaxies in space as a result of their regular movement.)

28. The nebula.

- (It is a glowing gaseous sphere rotating around itself, from which the solar system was originated.)

29. The phenomenon of star explosion.

- (Glowing of a star for a short time to become one of the most shining stars in the sky, then its glowing disappears gradually to return as it was.)

30. Somatic cells. (They are all body cells (except reproductive cells), such as: liver, heart, skin.....)

31. Chromosomes. (They are thread-like bodies present in cells' nuclei and they represent the genetic material of the living organism. They are thread-like bodies present in cells' nuclei and they represent the genetic material of the living organism.)

32. The DNA. (It is the nucleic acid that carries the genetic traits of the living organism.)

33. Tetrad.

- (It is the arrangement of homologous pairs of chromosomes, where each pair consists of 4 chromatids.)

34. Vegetative reproduction.

- (It is a type of asexual reproduction in plants by using vegetable organs without the need of seeds.)

35. Fertilization.

(It is the combination of a male gamete and a female gamete to form a zygote which contains the complete number of chromosomes of the organism.)

Question 7:

Give reasons for the following:

1. The metro is an example of motion in one direction.

(Because the metro moves forward or backward in a straight path or curved path or a combination of both.)

2. -It is practically difficult to make uniform (constant) speed.

-Most of moving cars cannot move inside crowded cities all the time at uniform speed.

- A moving car cannot travel the distance from Cairo to Alexandria at the same speed every time.

(Because the speed of the car changes according to the conditions of the road.)

3. The speed of moving objects increases as the time required covering a given distance decreases.

(Because $V = d/t$, so the object speed is inversely proportional to the time taken, when the distance is constant.)

4. The speed increases as the distance covered increases when time is constant.

(Because $V = d/t$, so the object speed is directly proportional to the distance covered, when the time is constant.)

5. The value of the relative speed of a moving object varies depending on the state of the observer.

(Because the relative speed of a moving object when the observer is:

- at rest, the relative speed is equal to its real speed.

- moving, the relative speed is more or less than its real speed, according to the direction of its movement relative to the object's motion.)

6. A moving observer cannot determine the actual speed of a moving object.

(Because the speed at which the moving observer determined, it may be more than or less than the real speed of the moving object, according to the direction of its movement related to the direction of the movement of the moving object.)

7. A car moving at 80 km/h appears to be stationary relative to another car moving in the same direction at the same speed.

(Because the relative speed equals the difference between their speeds equals zero..)

8. Mathematicians use mathematical re-relations between different variables.

(to describe certain phenomena.)

9. Physicists use the tools of mathematics, such as graphs and tables.

(in order to: Predict the relationship between certain physical quantities, Understand practical results, Describe the physical phenomena in a simpler way.)

10. Motion with uniform speed is represented in the graphical relationship (distance - time) by an inclined straight line passing through the origin.

(Because the distance is directly proportional to the time, when the object moves at a constant speed.)

11. An object whose motion is accelerated cannot move with uniform speed.

(Because its speed changes by passing of time.)

12. An object moving with a uniform speed has zero acceleration.

(Because its speed doesn't change as time passes [when $(\Delta V) = \text{Zero}$, then $(a) = \text{Zero}$])

13. The type of acceleration of an object can be determined by knowing its final velocity and initial speed.

(Because when moving at a positive acceleration, the final speed is greater than the initial speed, so the acceleration is positive, while when moving at a negative acceleration, the final speed is less than the initial speed, so the acceleration is negative.)

14. The person who runs for minutes then walks for other minutes, moves with negative acceleration.

(Because the final speed is less than the initial speed (its speed decreases as time passes), so the acceleration is negative.)

15. Displacement is a vector physical quantity while distance is a scalar physical quantity.

(Because distance is determined by magnitude only, while displacement is determined by magnitude and direction.)

16. The speed of a moving object is different from the velocity of a moving object.

(because the speed is a rate of change in distance (scalar quantity), but velocity is a rate of change in displacement (vector quantity).)

17. The amount of fuel consumed by a plane flies between two cities differs according to the wind direction.

(Because the plane that flies against the wind direction, its velocity decreases and consumes more fuel and takes more time than that flies in the same wind direction.)

18. Pilots take into account the velocity of the wind.

(Because the direction of the wind affects the velocity of the plane and hence the time of the trip and the amount of fuel consumed.)

19.-When you look in a mirror, you see your face image.

-The human being noticed that when he looked at the still water's surface, he could see the image of his face in the water. (Due to light reflection.)

20. Light reflection takes place.

(Due to the returning back of light rays in the same medium when they fall on as smooth shiny surface.)

21.-The incident light ray that falls perpendicular on a reflecting surface reflects on itself.

-A ray incident on a spherical mirror passing through the Center of curvature is reflected back to itself.

(Because the angle of incidence equals the angle of reflection equals zero. Because the angle of incidence equals the angle of reflection equals zero.)

22.A Plane mirror painted from behind with a thin layer of silver.

(to give the glass a bright surface that reflects the incident light rays that fall on it.)

23.Many people cannot write while looking at their writing in a flat mirror.

(Because the images formed by the plane mirror are laterally inverted (reversed).)

24.The word ambulance is written in reverse on the front of the ambulance.

(Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.)

25.A spherical mirror has one principal axis.

(It has one main axis, because it has one center of curvature and one pole.)

26.We use 2 rays from the object at least to get the Formed image.

(Because the image is formed at the intersection of the reflected rays or their extensions.)

27.- No image of the object is formed when placed at the focus of a concave mirror.

- The image of an object placed in the focus of a convex lens does not form an image.

(This is because the extensions of the reflected light rays are parallel to each other (don't intersect).)

28.We Can't determine the focus or radius of the Convex mirror practically.

(Because this focus is produced due to the collection of the extensions of the reflected rays, it cannot be received on a screen and lies behind the mirror.)

29.The image formed by a plane mirror , a convex mirror, and concave lens cannot be received on a barrier.

(Because it is a virtual image which is formed as a result of the intersection of the extensions of the reflected (or refracted for lens) light rays and lies behind the mirror.)

30. Concave mirrors are used in the manufacture of solar ovens.

(Because the concave mirror collects the reflected light rays falling on it at one point (focus) generating high temperature.)

31.- The lens has two centers of curvature while the spherical mirror has one center of curvature.

- The collective lens has two focus while the collective mirror has one focus.

(Because lens has two spherical surfaces, each surface has a center of curvature, but spherical mirror has one spherical surface.)

32. A convex mirror is placed at the corners of narrow roads.

(To monitor cars' movement on these narrow crossroads to avoid accidents.)

33. Convex mirrors are placed on subway platforms and train stations.

(To avoid passenger injury at opening or closing the Metro doors.)

34. A thick convex lens has a lower focal length than the focal length of a thin convex lens.

(Because in the thick convex lens, the convexity of its face is large, so the focus is nearer to the optical center (smaller radius of curvature), while in the thin convex lens, the convexity of its face is small, so the focus is farther from the optical center (larger radius of curvature).)

35. A concave lens is used to correct short-sighted person.

(Because it diverges the rays coming from the far objects before falling on the eye, so the image is formed exactly on the retina.)

36. Using a convex lens to treat long sightedness.

(Because the convex lens converges the rays, so the image of the nearby object is formed exactly on the retina.)

37.- Difference of forms of galaxies that form the universe.

- Each galaxy has a characteristic shape

(Because each Galaxy has a distinctive shape according to the harmony and order of the groups of stars in it.)

38. The galaxy Milky How is given that name?

(Because it appears in the sky at night as a splashing milk or spreading straw.)

39. The rotating planets stay in their orbits around the sun.

- It is impossible to collide two planets together. (Due to the Sun's gravity.)

40. The distances in the universe are measured by light years.

(Because the distances between stars are very large.)

- 41.** The continuous expansion of space. (Due to the movement of the galaxies apart.)
- 42.** Galaxies move away from each other. (As a result of their regular movement.)
- 43.** The Nebula loses its spherical shape and is converted to a revolving flat disc according to Laplace theory. (Due to the effect of the centrifugal force that resulted from the rotation of the nebula around itself.)
- 44.** The theory of the two scientists Chamberlain and Molten is called crossing star theory.
(because this theory assumed that there is another huge star (a crossing star) approached the Sun, and attracting the Sun to it, leading to a great expansion in the part of the Sun facing it.)
- 45.** The Sun escaped from the gravity of the huge star in the crossing star theory.
(due to the force of explosion of the expanded part of the sun facing the crossing star.)
- 46.** Stars are not enough to light the universe although they are large in number.
(because the glowing of a star occurs for a short time, then its glowing disappears gradually to return as it was.)
- 47.** The cell undergoes through interphase before the beginning of cell division.
(To prepare the cell for division through some important biological processes, where the genetic material duplicates.)
- 48.** Mitosis is important for children, unlike meiosis.
(Because mitotic division plays an important role in growth which the body of children needs, while meiotic division aims to the production of gametes only.)
- 49.** Spindle fibers shrink during anaphase in mitosis. (To form two identical groups of chromosomes.)
- 50.** Changes occurring in the final phase of mitosis are called reversed changes.
(Because the changes that occur in telophase are adverse to those that occur in prophase.)
- 51.** Meiosis is called reduction division.
(Because each one of the produced cells contains half the number of chromosomes of the original cell.)
- 52.** Crossing over causes genetic diversity in individuals of the same species.
(Because it contributes to genes exchanging between the two homologous chromosome's (two inner chromatids) and distributing them randomly in the gametes.)
- 53.** The technology for detecting cancer cells using gold nanoparticles depends on special proteins.
(Because the Nano-molecules of gold metal which stick to the surface of cancer cells, absorb the light energy of the laser and convert it into heat energy which leads to burning and killing of the cancer cells.)

54. Asexual reproduction preserves the genetic structure of the organisms.

- The organism resulting from regeneration reproduction is similar to the parent individual.

(Because it occurs through one parental individual by a mitotic division as the new individual gets a genetic copy identical to the parent.)

55. Reproduction in amoebae is considered as asexual.

(Because it depends on mitotic division producing two identical cells, each contains a complete copy of the parent genetic material.)

56. The parental individual that reproduces by binary fission disappears.

(Because it splits into two identical cells.)

57. Reproduction in yeast is similar to that of sponges.

(because both of them When become in a suitable environment each one grows by mitotic division to give a new organism identical to the parent.)

58. The presence of a sporophyte in bread mold.

(because when spores fall on a suitable environment (wet bread), Each spore grows by mitotic division to give a new organism (fungus) identical to the parent)

59. Regeneration is not considered reproduction in all cases.

(because it is the ability of animals to compensate for their missing parts without producing new organism.)

60. New grape varieties cannot emerge if propagated vegetables.

(Because the vegetable reproduction occurs through mitotic division, in which the new offspring obtains a complete copy of the parent genetic material.)

61. The number of chromosomes remains constant in individuals of the same species that reproduce sexually.

(Because each of male gamete and female gamete contains half the number of chromosomes (N), then by combination a zygote is formed which contains the whole number of chromosomes (2N).)

62. In sexual reproduction, individuals are produced that carry common traits from both parents.

(As the offspring resulted from the sexual reproduction getting his genetic traits from two sources (the male and the female).)

Question 8:What happens in the following:

1. If the object cuts the same distance in half the time with respect to its speed.

(The speed will increase to double its value.)

2. If the moving object takes twice the time to travel half the distance relative to its speed.

(The speed will remain constant.)

3. When the velocity of an object is increased to double at a constant rate with respect to the covered distance. (The distance will increase to twice its value.)

4. When a car driver presses the brakes to stop his car after a period of time.

(The final speed of the car equals zero and the acceleration of its movement is described as decelerating motion.)

5. The movement of the aircraft against the wind in relation to the time of flight and the amount of fuel consumed.

(The value of its velocity decreases due to the resistance of the wind to the movement of the plane, so the time of the trip increases and therefore the amount of the fuel consumed increases.)

6. Light falls on a plane mirror at an angle of 45° . (The angle of incident = 45° .)

7. Place a plane mirror to the left of the driver instead of a convex mirror.

(An equal image is formed in the plane mirror, so the driver doesn't see the whole way behind him.)

8. The object is closer to a concave mirror according to the size and position of the formed image.

(The size of the image will increase and its position will become farther away from the mirror.)

9. When gravity is absent?

(The planets will leave their orbits and float in a random fashion in space, and therefore there will be no solar system.)

10. Fusion of atomic particles after minutes from Big Bang.

(producing gaseous clouds of hydrogen and helium with a percentage of 75%: 25% respectively formed the galaxies, stars and universe through millions of years.)

11. The nebula loses its temperature according to Laplace theory.

(its size contracted and its rotating speed around itself (its axis) increased.)

12. Explosion of the part that extends between the sun and the crossing star according to the theory of the two scientists Chamberlain and Molten?

(The Sun escaped from the gravity of that star, and a gaseous line of great length was formed from the Sun to the last planets.)

13. Explosion of a great star?

(The star bombs huge amounts of gaseous materials as a result of this explosion, which led to increasing its size and its shining.)

14.- The nucleus is removed from the cell.

- Absence of the nucleus in somatic cells of the liver.
- The cell does not undergo interphase before cell division (The cell division doesn't occur.)

15. Mitosis does not occur in somatic cells.

(the living organisms do not grow, and can't compensate for the damaged cells, or complete the asexual reproduction process)

16. Absence of a centrosome in an animal cell.

(The spindle fibers are not formed therefore the cell division is not completed.)

17. A human reproductive cell divides by meiosis?

(-The resulting offspring have new genetic traits different from parents' traits, so it is a source of genetic variation.)

18. Crossing over does not occur during meiosis of a reproductive cell.

(No variation of genetic traits among the members of the same species takes place.)

19. Meiosis in the anther and ovary of a flower in plants.

(Producing gamete cells containing half the number of chromosomes; pollen grains from anther and eggs from the ovary.)

20. Focusing laser light on gold nanoparticles in cancer cells.

(The golden nano-particles absorb the light energy and convert it into heat energy, which burns and kills the infected cancer cells.)

21. The starfish lost one of its arms, which contained part of the central disk.

(When a starfish loses one of its arms that contains a part of the central disc. This part can grow forming a complete animal.)

22. Placing the yeast fungus in a warm sugar solution. (Reproduction by budding in a yeast fungus.)**23.** Buds remain attached to the yeast fungus wall. (Forming a colony.)**24.-** Bursting of the sporangia of the bread mold fungus.

- The germinal capsule in the bread mold bursts.

(a large number of spores are released that When fall on a suitable environment (wet bread), Each spore grows by mitotic division to give a new organism (fungus) identical to the parent.)

25. A kind of living organism stops its reproduction process. (it will extinction.)

Question 9:

When the following happen:

- 1.** The speed of an object equals zero. (when the object at the rest.)
- 2.** The magnitude of speed equal to the magnitude of distance?
(When the object covers this distance through a unit time (1 hour or 1 minute or 1 second).)
- 3.** The value of the average speed of a moving object varies with the value of its speed at any moment. (when the object moves by an irregular speed.)
- 4.** The relative speed of a car equals three times the speed of an observer who moves at a speed equals 10 km/hr.
(When the object moves in the opposite direction to the observer's movement, by actual speed is equal 20 km/hr.)
- 5.** Relative speed of a moving object equals zero.
(When the observer moves in the same direction and at the same speed of the moving object.)
- 6.** Acceleration at which the object moves equal to the amount of the change of its speed.
(when the change in time (Δt) equal unity (1 hour or 1 minute or 1 second).)
- 7.** Acceleration is positive. (when the final speed is greater than initial speed.)
- 8.** Acceleration is negative. (when the final speed is less than initial speed.)
- 9.** -The displacement caused by a moving object is zero.
- The velocity of an object traveling in a circular path = zero.
(When the object returns to its primary position of movement, where the final position of movement is the same as its primary position.)
- 10.** The magnitude of the distance is greater than the magnitude of the displacement.
(When the object moves in a curved path (or any path doesn't represent a straight line.))
- 11.** The displacement of two different objects is equal?
(When they have the same magnitude and move in the same direction.)
- 12.** Light rays are reflected.
(the light returning back in the same medium, when it strikes a reflecting surface.)
- 13.** The mirror's focus produced?
(due to the collection of the reflected rays of the emitted light rays coming from a far object.)

14. A real image of an object placed in front of the mirror at the same position.

(when the object is located at the centre of the mirror curvature.)

15. A virtual magnified image of an object is formed.

(when the position of the object from the mirror at a distance less than focal length [Between the focus (F) and the pole (P)].)

16. An approximate minimized image of an object is formed behind the mirror.

(When the object is located in front of the convex mirror at any point.)

17. A beam of light passes through the optical center of the lens.

(It passes through the lens without refraction.)

18. Placing an object in front of a convex lens (concave mirror) at its focal point.

(no image is formed or a lighted spot is formed at the infinity.)

19. Cataract disease of the eye. (The difficulty of vision as a result of the darkness of the eye lens.)

Question 10:

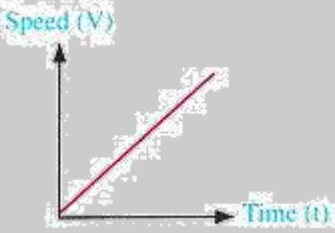
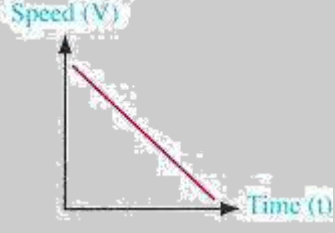
Compare between the following:

1. average speed and non-uniform speed.

P.O.C	Average speed	non-uniform speed
Definition:	It is the total distance covered by the moving object divided by the total time taken to cover this distance.	It is the speed at which an object moves when it covers equal distances at equal periods of time.

2. Types of uniform acceleration.

P.O.C	Positive uniform acceleration	Negative uniform acceleration
Definition:	It is an acceleration at which an object moves when its speed increases by equal values through equal periods of time.	It is an acceleration at which an object moves when its speed decreases by equal values through equal periods of time.
The relation between final and initial velocity:	$V_f > V_i$	$V_f < V_i$
Its sign:	Positive (+)	Negative (-)
Happens when:	When starting our motion from the rest. (non-uniform speed)	When we applies breaks. (non-uniform speed)

Graph:		
The type of motion:	Accelerating motion.	Decelerating motion.

3. Scalar physical quantity and vector physical quantity (according to: definition -examples).

P.O.C	Scalar physical quantity	vector physical quantity
Definition:	It is the physical quantity that has magnitude only and has no direction.	It is the physical quantity that has magnitude and direction.
Examples:	Mass (kg). - Time (Second or Hour). Length or Distance or height (m). Speed (m/sec or km/h). - volume (cm ³) Density (Kg\ cm ³). -Area (m ²). Temperature (OC). -Energy (joules). Radius or diameter (cm).	Force or weight (Newton). Velocity (m/sec. or km/h). Displacement (m). Acceleration (m/sec ² or km/h ²).

4. Convex mirror and concave mirror: (Definition - Focal length - center of curvature).

P.O.C	concave mirror	Convex mirror
Definition:	It is the mirror, which reflects (shining) surface is a part of the inner surface of the sphere.	It is the mirror, which reflects (shining) surface is a part of the outer surface of the sphere.
Focal point:	Real or virtual.	Always virtual, behind the reflecting surface
center of curvature:	in front of the reflecting surface.	behind the reflecting surface.

5. The real image with the virtual image.

P.O.C	real image	virtual image
Definition: (Ability to be received on a screen)	It is the image that can be received on a screen.	It is the image that cannot be received on a screen.
Formed when:	- It is formed as a result of the intersection of the reflected light rays.	It is formed as a result of the intersection of the extensions of the reflected light rays.
Site of its formation regarding the surface of the mirror.	It is formed in front of the mirror.	It is formed behind the mirror.

6. Convex lens and concave lens:

P.O.C	Convex lens	concave lens
Definition:	It is a transparent optical piece which is thick at its center and less thick at the tips.	It is a transparent optical piece which is thin at its center and thicker at the tips.
uses:	To treat the long-sightedness. To collect the light rays To form magnified images.	To treat the short-sightedness. To diverge the light rays To form minimized images.
type of focus type of image it forms:	Real or virtual.	Always virtual.
how to obtain a virtual image:	Put the object at the focus point.	It is always virtual wherever the position of object.

7. The principal focus of a concave mirror and the principal focus of a concave lens:

P.O.C	principal focus of a concave mirror	principal focus of a concave lens
Definition:	It is the straight line that passes by the pole of the mirror (P) and its center of curve (C).	It is the straight line that joins the two centers of curvature of the lens passing the optical center of the lens.

8. shortsightedness and longsightedness in terms of:

P.O.C	Short-sightedness	Long-sightedness
Definition:	It is a vision defect through which near objects only can be seen clearly but far objects seem distorted.	It is a vision defect through which far objects only can be seen clearly but near objects seem distorted.
causes:	-Increase in the eyeball diameter. OR -Increase in the convexity of the eye lens surface.	-decrease in the eyeball diameter. OR -decrease in the convexity of the eye lens surface.
The position of the formed image:	In front of the (before) retina.	Behind the (after) retina.
The type of lens used in correcting each one:	By using a concave lens.	By using a convex lens.

9. the three theories which explain the origin of the solar system:

P.O.C	Nebular theory	The crossing star theory	Modern theory
Founder of the theory:	Laplace.	Chamberlain and Moulton.	Fred Hoyle.
Origin of solar system:	A glowing gaseous sphere rotating around itself. (Nebula)	The Sun.	A star rather than the Sun.
Forces shared in formation of solar system:	The centrifugal force arising from the rotation of nebula around its axis.	The force of attraction of the crossing star and the force of explosion of the expanded part of the Sun.	The force of explosion of the huge star resulting from the occurrence of sudden and violent nuclear reactions.

10. Somatic cells and reproductive cells in terms of:

P.O.C	Somatic cells	reproductive cells
number of chromosomes:	Diploid number (2N).	
type of division:	Mitotic (Mitosis).	Meiotic (meiosis).
number of resulting cells:	2 somatic cells.	4 gamete cells.

11. Explain the differences between meiosis I and meiosis II.

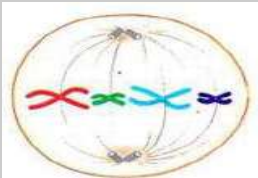
P.O.C	meiosis I	meiosis II
Differences:	✓ Interphase. ✓ Genetic material is doubled. Through anaphase I, the centromere doesn't split.	X interphase. X genetic material is not doubled. Through anaphase II, the centromere Split.

12. Mitosis and meiosis in terms of:

P.O.C	Mitosis	Meiosis
purpose of division:	- Growth of living organisms. - Compensation of damaged cells. - Completion of the asexual reproduction process.	Formation of gametes. In males: sperm or pollen grains. In females: ova or ovules.
Location:	Somatic cells	reproductive cells
number of resulting cells:	2 somatic cells.	4 gamete cells.

number of chromosomes in the resulting cells:	Diploid number (2N).	haploid number (N).
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13. Metaphase of mitosis and metaphase of meiosis I.

P.O.C	mitosis	Meiosis I
Metaphase:	The chromosomes which are connected with the spindle fibers are arranged at the cell equator. 	The chromosomes pairs which are connected with the spindle fibers are arranged at the cell equator. 

14. reproduction by binary fission and reproduction by budding.

P.O.C	binary fission	budding
Definition:	It is a type of asexual reproduction where the nucleus divides mitotically, then the cell splits into two identical cells.	It is a type of asexual reproduction that produces new individuals by forming buds in the parent cell.
It occurs in:	Unicellular protozoans, Such as: Amoeba - Paramecium - Euglena. Simple algae and bacteria	Unicellular organisms, Such as: Yeast fungus. Multicellular organisms, Such as: Hydra and sponges

15. reproduction by binary fission and mitotic cell division.

P.O.C	binary fission	mitotic
Types of cell:	It occurs in uni living organisms only.	It occurs in somatic cells of uni, multi, and higher living organisms

16. Sexual and asexual reproduction.

P.O.C	sexual reproduction	asexual reproduction
the number of individuals involved :	-It occurs by two living organisms, one of them is a male and the other is a female.	- It occurs by one living organism.
the type of division upon reproduction which depends:	-It depends on meiotic division.	-It depends on mitotic division.

the genetic characteristics of the resulting offspring:

- The new offspring combines the genetic traits from two sources (the male and the female).

-The new offspring gets a full copy of the parent individual's genetic traits.

Question 11:

Solve the following problems:

1. Which is moving faster and why? A train moving at a speed of 90 km/h or a car covering a distance of 40 meters in 2 seconds.

The speed of the train: $V = 90 \times \frac{5}{18} = 25 \text{ m/s}$. The speed of the car: $V = \frac{\text{distance}}{\text{Time}} = \frac{40}{2} = 20 \text{ m/s}$.

The speed of the train is faster than the speed of the car.

2. Two bodies, A and B, each move at a constant speed as follows:

Body A moves according to the relation $d = t^2$

Body B moves according to the relation $d = 2t$. Calculate the ratio between the speed of body B and the speed of body A, knowing that the time of the motion is constant.

$$V_A = \frac{\frac{t}{2}}{t} = \frac{t}{2t} = 0.5 \text{ m/s}$$

$$V_B = \frac{2t}{t} = \frac{t}{2t} = 2 \text{ m/s}$$

$$\frac{V_B}{V_A} = \frac{2}{0.5} = 4$$

3. A train started its journey at five o'clock in the evening. When will it arrive if the train is moved at a speed of 70 km/h to cover a distance of 700 kilometers?

$$t = \frac{\text{distance}}{\text{speed}} = \frac{700}{70} = 10 \text{ h. The time of the arrival : at three o'clock in the afternoon (3 pm).}$$

4. A Car moves at a regular speed equals 90 km/h, this means that the car covers a distance equals what (m) in 40 sec.

$$90 \text{ Km/h} \rightarrow 1 \text{ h}$$

$$9000 \text{ m} \rightarrow 3600 \text{ sec}$$

$$?? \text{ m} \rightarrow 40 \text{ sec}$$

$$d = \frac{40 \times 9000}{3600} = 1000 \text{ m}$$

5. Two cars are traveling from the same starting point. The first is traveling at 60 km/h and the second is traveling at 80 km/h. Calculate the difference between the time the two cars reach the end position, which is 120 km away from the starting point.

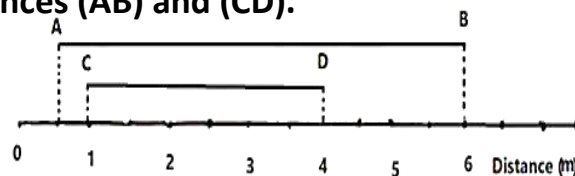
$$\text{The time of the first car : } t = \frac{\text{distance}}{\text{speed}} = \frac{120}{60} = 2 \text{ h.}$$

$$\text{The time of the second car : } t = \frac{\text{distance}}{\text{speed}} = \frac{120}{80} = 1.5 \text{ h.}$$

$$\text{the difference between the time the two cars} = 2 - 1.5 = 0.5 \text{ h.}$$

6. The following figure shows the distance covered by a bicycle (AB) and the distance covered by the other bicycle (CD). Calculate the difference between distances (AB) and (CD).

The difference between distances (AB) and (CD) = $5.5 - 3 = 2.5$ m.



7. Two students walked out of the school, one moving at 2 m/s and the other moving at 3 m/s. Calculate:
- A- Their distance from the school after two minutes.
- B- The time required for each of them to cover a distance of 400 meters.

A- The distance of 1st student = $V \times t = 2 \times 120 = 240$ m.

The distance of 2nd student = $V \times t = 3 \times 120 = 360$ m.

B- The time of 1st student = $\frac{\text{distance}}{\text{speed}} = \frac{400}{2} = 200$ s.

The time of 2nd student = $\frac{\text{distance}}{\text{speed}} = \frac{400}{3} = 133.3$ s.

8. An object travels a distance of 600 meters in one minute and then 720 meters in the second minute. Calculate its average speed:

A) During the first minute.

B) During the second minute.

C) During both minutes.

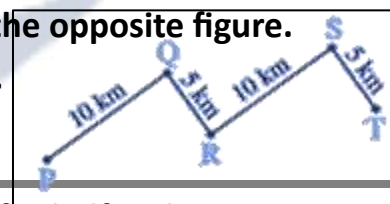
A) average speed = $\frac{\text{distance}}{\text{time}} = \frac{600}{1} = 600$ m/min.

B) average speed = $\frac{\text{distance}}{\text{time}} = \frac{720}{1} = 720$ m/min.

C) average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{600+720}{2} = 660$ m/min.

9. A car traveled from point (P) to point (T) within 30 minutes as shown in the opposite figure. What is the average speed of the car? Write the mathematical law used.

average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{10+5+10+5}{30} = 1$ Km/min = 60 Km/h.



10. A person covered a distance of 100 km in 2 hours in a car, then stopped for half an hour to rest and then continued his journey by covering a distance of 75 km in 1 hour, what is the average speed of the person and the car in this journey?

average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{100+75}{2+0.5+1} = 50$ Km/h.

11. If a car takes 4 hours on its journey and its speed at the first hour is 100 km/h, at both the second and third hours it is 80 km/h, and in the fourth hour it is 40 km/h. Calculate the average speed. The distance (first hour) = speed $\times$ time = $100 \times 1 = 100$ Km.

The distance (second, third hours) = $80 \times 2 = 160$ Km.

The distance(fourth hour) = $40 \times 1 = 40$ Km.

$$\text{average speed} = \frac{\text{total distance}}{\text{total time}} = \frac{100+160+40}{4} = 75 \text{ Km/h.}$$

12. A bicyclist covers 45 km at an average speed of 18 km/h, but he covers the first 15 kilometers in an hour. What is the speed at which he covers the rest of the distance?

$$\text{Total time} = \frac{\text{distance}}{\text{speed}} = \frac{45}{18} = 2.5 \text{ h.} \quad \text{The remaining time} = 2.5 - 1 = 1.5 \text{ h}$$

The remaining distance = $45 - 15 = 30$ Km.

The speed at which he covers the rest of the distance = $30/1.5 = 20$ Km/h

13. Two trains are traveling in the same direction. If the speed of the first train is 30 km/h and the speed of the second train is 70 km/h, what is the relative speed of the second train to an observer:
-Standing on the platform. -Sitting inside the first train.

A) the relative speed = actual speed = 70 Km/h.

B) the relative speed = actual speed - observer speed = $70 - 30 = 40$ Km/h.

14. Calculate the actual speed of a car that appears to be moving at 50 km/h to an observer moving at 30 km/h in the opposite direction.

the actual speed = the relative speed - observer speed = $50 - 30 = 20$ Km/h.

15. If the relative speed of the steamship is 550 km/h as monitored by an aircraft moving in the opposite direction at a speed of 425 km/h, What is the time taken by the steamship from the moment it monitors the plane for its movement until it arrives at the port at a distance of 60km? The actual speed of the steamship = $550 - 425 = 125$ Km/h.

$$t = \frac{d}{v} = \frac{60}{125} = 28.8 \text{ min.}$$

16. Two cars move up a slope. The first car moves upwards at an initial speed of 20 m/s and an acceleration of -2 m/s^2 , while the second car moves downward the same slope at an initial speed of 5 m/s and an acceleration of 5 m/s^2 . If the two cars meet after 6 seconds, calculate the relative speed of the first car based on the driver of the second car.

$$V_f = V_i + (a \times \Delta t)$$

$$(1) V_f = 20 + (-2 \times 6) = 8 \text{ m/s.}$$

$$(2) V_f = 5 + (5 \times 6) = 35 \text{ m/s.}$$

$$R.s = A.s + O.s = 8 + 35 = 43 \text{ m/s.}$$

17. In the figure opposite: Shows the motion of the objects (x and y):

A) What kind of speed does the object move at? Regular speed.

B) Calculate the ratio between the speeds of the two objects.

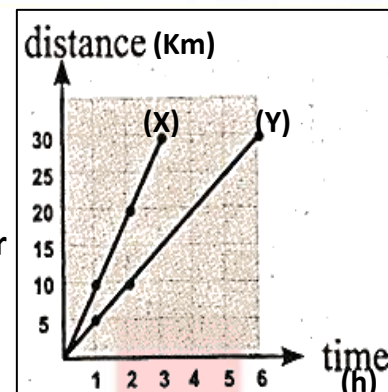
$$\text{speed of (x)} = \frac{d}{t} = \frac{30}{3} = 10 \text{ Km/h.} \quad \text{speed of (Y)} = \frac{d}{t} = \frac{30}{6} = 5 \text{ Km/h.}$$

$$\text{the ratio} = \frac{10}{5} = 2$$

C) Calculate the ratio between the distance covered by the two objects after 30 minutes from starting the motion.

$$\text{Distance of (x)} = v \times t = 5 \times 30 = 150 \text{ Km/min.}$$

$$\text{speed of (Y)} = v \times t = 2.5 \times 30 = 75 \text{ Km/min.} \quad \text{the ratio} = \frac{150}{75} = 2$$

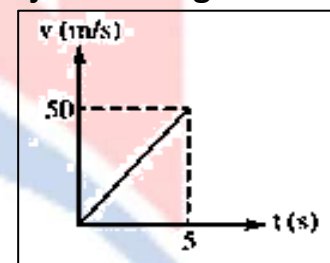


18. The opposite graph: Shows the relationship between speed and time of an object moving with uniform acceleration from rest.

Calculate its final speed after 20 seconds from starting the motion.

$$a = \frac{V_f - V_i}{\Delta t} = \frac{50 - 0}{5 - 0} = 10 \text{ m/s}^2.$$

$$V_f = V_i + (a \times \Delta t) = 0 + (10 \times 20) = 30 \text{ m/s.}$$



19. A train was moving at a speed of 18 m/s and when the driver applied the brakes it stopped after 3 minutes. Calculate the acceleration of the train, and identify its type.

$$a = \frac{V_f - V_i}{\Delta t} = \frac{0 - 18}{3} = -6 \text{ m/s}^2.$$

Type: negative acceleration

20. A car is moving at a speed of 80 m/s and when the driver applies the brakes, it acquires a decreasing acceleration of 2 m/s². Calculate the speed of the car after 12 seconds from the moment the brakes are applied. $V_f = V_i + (a \times \Delta t) = 80 + (-2 \times 12) = 56 \text{ m/s.}$

21. An object moves with (10 m/s) speed, calculate the time required for its speed to become double, knowing that the object moves with an acceleration equals (2 m/s²).

$$t = \frac{V_f - V_i}{a} = \frac{20 - 10}{2} = 5 \text{ s.}$$

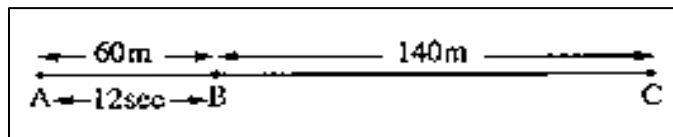
22. A car moves at a speed of 54 km/h. When the driver uses the brakes to decrease its speed to 36 km/h in 2 seconds, calculate the time needed to stop the car from the moment the brakes are applied. (Knowing that the car moves at a uniform acceleration).

$$a = \frac{V_f - V_i}{\Delta t} = \frac{36 - 54}{2} = -9 \text{ Km/h}^2.$$

$$t = \frac{\Delta V}{a} = \frac{0 - 54}{-9} = 6 \text{ s}$$

23. An object moves at a uniform speed from point A to point B, covering a distance of 60 m in 12 seconds. Then it moves at a uniform acceleration from point B to point C. Calculate the following according to the relation $[a = 20 \div t]$:

1. The uniform speed in period AB. $V_i = \frac{d}{t} = \frac{60}{12} = 5 \text{ m/s.}$

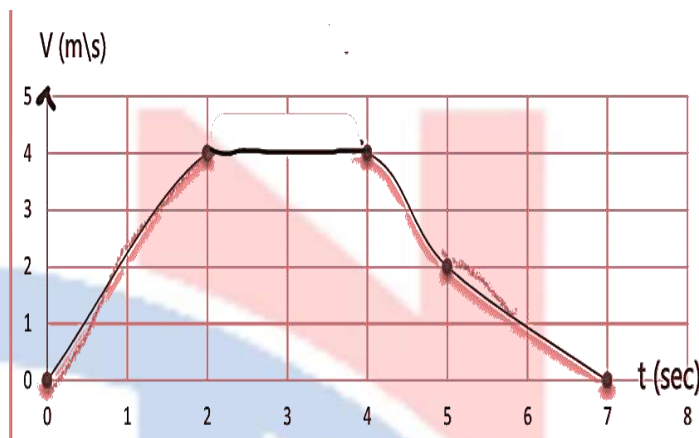


2. The final speed in period BC. $V_f = V_i + (a \times \Delta t) = 5 + \left(\frac{20}{t} \times \Delta t\right) = 25 \text{ m/s}$.

24. A car started moving from rest and after 2 seconds its speed became 4 m/s and remained at the same speed for another 2 seconds. The driver then had to use the brakes to slow down to 2 m/s in the fifth second and came to a complete stop after another 2 seconds.

- 1) Design a table with the speed and time values of the car's motion.
- 2) Graphically represent the motion of the car using the relationship (speed - time).

Time (sec)	2	4	5	7
Speed (m/s)	4	4	2	0



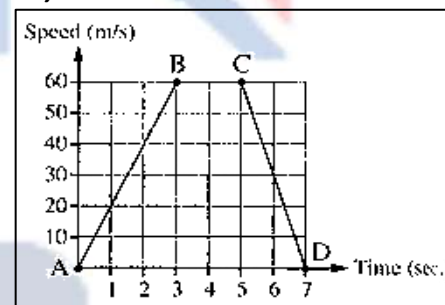
25. Study the opposite figure, which represents the movement of an object, then answer:

Calculate the acceleration at which the body moves in period (AB).

$$a = \frac{V_f - V_i}{\Delta t} = \frac{60 - 0}{3 - 0} = 20 \text{ m/sec}^2.$$

What type of acceleration is there in period (CD)?

Negative acceleration



26. If a body starts to move from rest at a uniform acceleration, which can be calculated from the relation: (acceleration) $a = 10/t$, find:

1. The final speed of the body.
2. The type of acceleration of the moving body.

$$1) V_f = V_i + (a \times \Delta t) = 0 + \left(\frac{10}{t} \times \Delta t\right) = 10 \text{ m/s}.$$

2) positive acceleration.

27. An object moves at a uniform acceleration for 15 seconds, reaching a speed of 72 km/h after 5 seconds and then 54 km/h after another 10 seconds:

(a) Calculate the acceleration of the moving object.

(b) What type of acceleration is it?

(c) Calculate the initial speed of this object.

$$a) V_i = 72 \times \frac{5}{18} = 20 \text{ m/s}.$$

$$V_f = 54 \times \frac{5}{18} = 15 \text{ m/s}.$$

$$a = \frac{V_f - V_i}{\Delta t} = \frac{15 - 20}{15 - 5} = -0.5 \text{ m/s}^2.$$

b) Negative acceleration.

c) as the object moves at a uniform acceleration:

$$a_1 = a_2 = -0.5 \text{ m/s}^2$$

$$V_i = V_f - (a \times \Delta t) = 15 - [-0.5 \times (5 + 10)] = 22.5 \text{ m/s}.$$

28. Study and concentrate: You have 5 cars moving at the same speed of 70 km/h in the paths marked on the drawing, so if the length of the side of the square = 1 km, Answer the following:

1. Cars 2 and 3 reach the endpoint after passing. $t = \frac{d}{v} = \frac{14}{70} = 0.2 \text{ h.}$

2. Which of the cars traveled the same distance? **Cars 2, 3 and 4.**

3. Cars 2 and 3 are equal in **distance, speed, time** but differ in **displacement, velocity**

4. Cars 1 and 5 meet after passing $t = \frac{d}{v} = \frac{5}{70} = 0.7 \text{ h.}$ at a distance of **5 km.**

5. Calculate the velocity of cars 2 and 4?

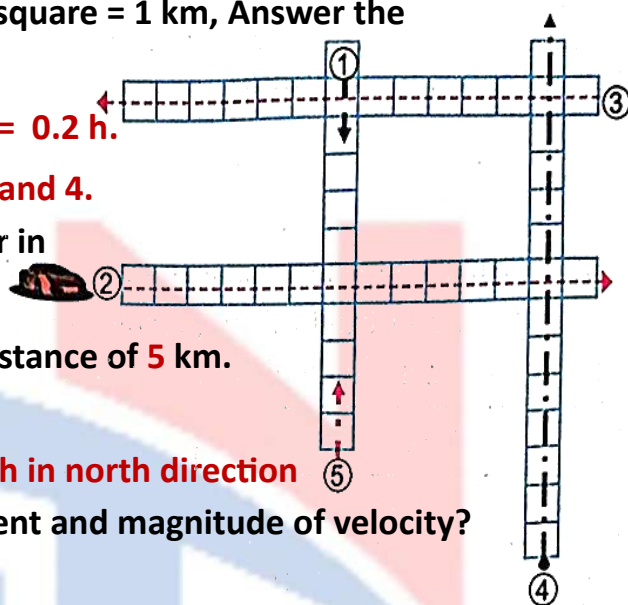
Car 2 = 70 km/h in east direction

Car 4 = 70 km/h in north direction

6. How many cars have the same magnitude of displacement and magnitude of velocity?

the same magnitude of displacement = cars 2,3,4.

the same magnitude of velocity = all cars



29. A rectangular swimming pool is 15 meters long and 6 meters wide. What is the distance and displacement traveled by a swimmer if he swims back and forth?

Distance = 15 + 6 + 15 + 6 = 42 m

displacement = zero

30. A runner traveled 90 m north in 45 seconds, 180 m east in 60 seconds and 90 m south in 9 seconds, calculate: A - The average speed of the runner. B - Velocity.

A- average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{90+180+90}{45+60+9} = 3.1 \text{ m/s.}$

B- Velocity = $\frac{\text{displacement}}{\text{total time}} = \frac{180}{45+60+9} = 1.5 \text{ m/s. in west direction}$

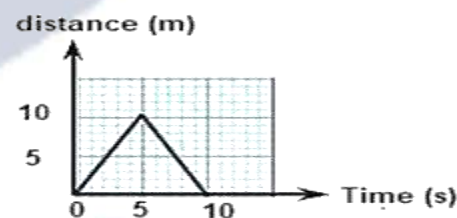
31. From the corresponding figure, calculate:

a) Distance. = 10+10 = 20 m

b) Displacement. = zero

c) Velocity during the first five seconds.

= $\frac{\text{displacement}}{\text{time}} = \frac{10}{5} = 2 \text{ m/s. in a certain direction}$

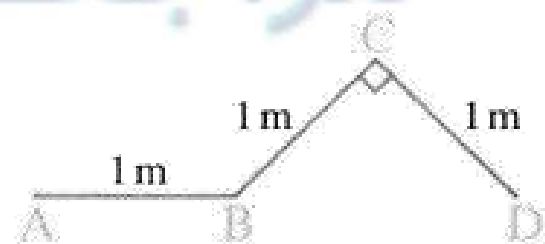


32. In the opposite figure: An object is moved from A to D, passing through B and C. Calculate the displacement of this object.

$$\begin{aligned} BD &= \sqrt{(BC)^2 + (CD)^2} \\ &= \sqrt{1^2 + 1^2} = \sqrt{2} \text{ m} \end{aligned}$$

Displacement = AB + BC

= 1 + $\sqrt{2}$ m in east direction ($\overline{AD}$).



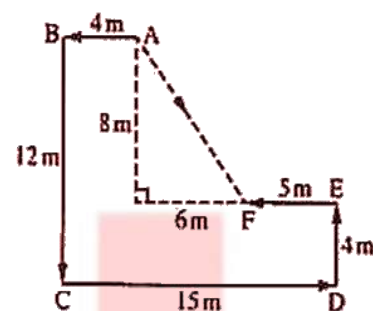
33. In the opposite figure: An object moves from point A to point F passing by points B, C, D, and E in 8 seconds, Calculate:

1. Average speed. $= \frac{\text{total distance}}{\text{total time}} = \frac{4+12+15+4+5}{8} = 5 \text{ m/s.}$

2. Average velocity. $= \frac{\text{displacement}}{\text{time}} = \frac{10}{8} = 1.25 \text{ m/s.}$

in southern east direction. (AF) direction

Displacement
 $= \sqrt{6^2 + 8^2}$
 $= \sqrt{100}$
 $= 10 \text{ m. in the southern east direction (AF direction)}$

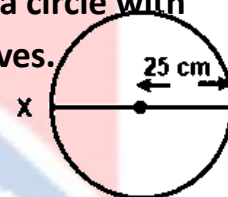


34. The opposite figure represents the motion of an object on the circumference of a circle with a radius of 25 cm. Find the magnitude of the displacement of the object as it moves.

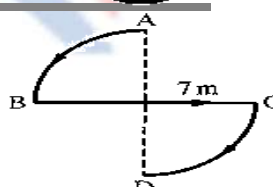
a) One complete rotation. = zero

b) Half a rotation. = $2r = 50 \text{ cm}$

c) quarter rotation. $= \sqrt{(25)^2 + (25)^2} = 35.3 \text{ cm}$



35. A car is moving in a circular path with a radius of 7 meters and a circumference of 44 meters from point (A) to point (D) through points (B) and (C) in 10 seconds. Prove that the average speed is greater than the car's velocity.



Average speed. $= \left[\left(\frac{1}{2} 2 \pi r \right) + \text{diameter} \right] \div \text{time} = \left[\left(\frac{1}{2} \times 2 \times 3.14 \times 7 \right) + 14 \right] \div 10 = 3.598 \text{ m/s.}$

Average velocity. $= \frac{\text{displacement}}{\text{time}} = \frac{14}{10} = 1.4 \text{ m/s. in south direction. (AD) direction}$

36. In a clock, if the length of the hand of seconds is 7 cm, Calculate the time taken by the tip of the hand of seconds to cover a displacement equals 14 cm. (time = half minute = 30 seconds)

37. If the angle between the incident light ray and the reflected ray on a plane mirror is 140° , what is the angle between the incident ray and the reflective surface?

The angle $= (180 - 140) \div 2 = 20^\circ$

38. A person 165 cm tall stood 3 meters away from a plane mirror and formed an image in the mirror. Answer the following:

a) What are the properties of the image formed, and what is the distance between the image and the mirror? **properties: (upright, the same size as the object, laterally inverted, virtual).**

The distance between the image and the mirror: = 3 m

b) If the person moves 1 meter away from the mirror, what is the distance between the image formed and the first image? = 1 m

c) If the mirror is moved 2 meters in the direction of the person, calculate the distance between the image formed and the first image. = 4 m

39. If the distance between a person and his image in a mirror is 12 metres, what is the distance required for the person to move so that the distance between the position of the new image and the old one is 4 metres? **the distance required for the person to move = 4 m**

40. Nashwa stood halfway between a plane mirror and a concave mirror, forming two equal images, one upright and one inverted.

A) In which of the two mirrors was the inverted image formed? **concave mirror**

b) If the distance between the two mirrors is 200 cm, calculate:

1- The focal length of the concave mirror. = $200 \div 4 = 50 \text{ cm}$

2- Nashwa's distance from her image in the plane mirror. = **200 cm**

41. An object 6 cm long was placed 9 cm in front of a spherical mirror and formed an image on the barrier. The length of the image was equal to the length of the object.

a. What type of mirror is it? **Concave mirror**

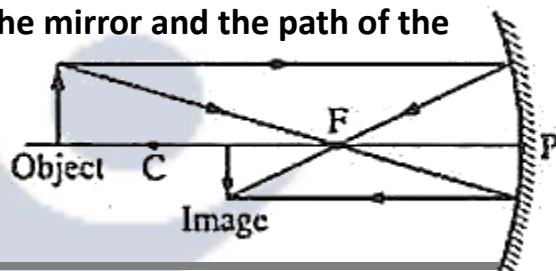
b. Calculate the focal length of the mirror and its radius of curvature. **F = 4.5 cm r = 9 cm**

42. An object is placed 10 cm from a concave mirror with a focal length of 4 cm.

(a) Draw a diagram to show the path of the rays incident on the mirror and the path of the rays reflected from it.

(b) Mention the properties of the formed image.

real, inverted and smaller than the object.



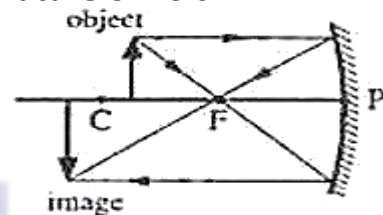
43. An object is placed 12 cm away from a concave mirror with a radius of curvature of 16 cm.

a. Calculate the focal length of the mirror. **F = $r \div 2 = 16 \div 2 = 8 \text{ cm}$.**

b. Draw the path of the rays forming the image of the object.

c. Mention the properties of the formed image.

Real, inverted, and magnified



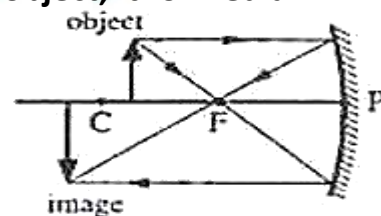
44. An object placed 8 cm away from a spherical mirror with a radius of curvature of 16 cm did not form an image. When the mirror was moved 5 cm away from the object, it formed an image on the barrier:

a. What type of mirror? **Concave mirror**

b. Identify the location and characteristics of the image formed.

location: **at a distance greater than twice the focal length.**

Its properties: **real, inverted, and magnified**



45. An object is placed 10 cm away from a spherical mirror with a radius of curvature of 12 cm, and then the mirror is displaced 2 cm in the direction of the object to form an image. Locate and describe the image formed, explaining your answer with a drawing. **(The same Q number 44)**

46. A thin, hollow glass ball with a shiny outer surface and a diameter of 24 cm, a suitable part of which was cut into the shape of a mirror.

a- What type of mirror is formed? **Convex mirror**

b- Calculate the focal length of this mirror. **$F = d \div 4 = 24 \div 4 = 6 \text{ cm}$**

c- What are the characteristics of the image formed by this mirror when the object is placed 12 cm away from its pole? **real, inverted and equals to the object.**

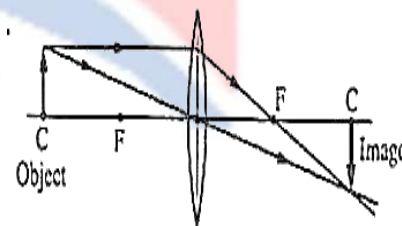
47. A body whose length is 4 cm is at a distance of 6 cm from a convex lens whose focal length is 3 cm. Draw a diagram to show the path of the rays incident on the lens and the refracted ones from it, then state:

(a) The properties of the image formed. – **Real, Inverted, Equal to the object.**

(b) The length of the image. **= 4 cm.**

(c) The radius of curvature of the lens. **= 6 cm.**

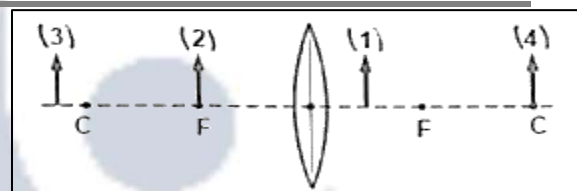
(d) The position of the image. **At the centre curvature ©**



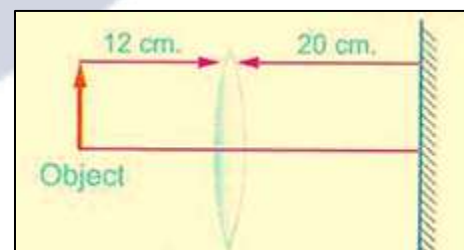
48. From the opposite figure: In which of the positions (1) to (4) is it appropriate to position the object so that

a) an upright, magnified, and virtual image of it is in the same direction as the object? **Position (1).**

b) No Image formed? **Position (2).**



49. In the opposite figure, a convex lens formed an image of the object at its left side at a distance of 12 cm. This image is real, inverted, and equal to the object in front of a reflecting surface of a plane mirror that is 20 cm away from the lens.

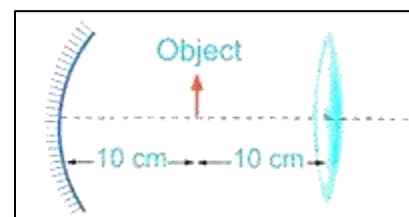


Conclude each of the following:

(a) Focal length of the convex lens. **= 6 cm.**

(b) The distance between the object and the image formed by the plane mirror. Is the image formed by the plane mirror upright or inverted with respect to the object? **40 cm, inverted.**

50. In the opposite figure, an object is placed between a convex lens with a focal length of 5 cm and a concave mirror with a focal length of 5 cm.

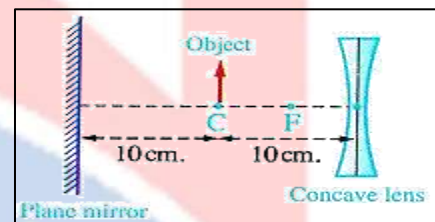


(a) Find the distance between the image formed by the convex lens and the image formed by the concave mirror. = **20 cm**

(b) Mention the properties of the image formed by the concave mirror.

Real, inverted, equal in size.

51. In the opposite figure, determine the ratio between the length of the image formed for the object by the plane mirror and that formed by the concave lens.



(greater than - smaller than - equal to) one? **greater than one**

With the reason? **Because the plane mirror formed equal image, but concave lens always formed diminished image.**

Question 12:

Find out the different word that does not fit the following

1. Mass of an object 100 kg - Its length 16 cm - It covers 50 m - **By speed equals 120 m/s.**
2. m/s - $\text{m}\times\text{s}^{-1}$ - km/s - **$\text{m}\times\text{s}^2$.**
3. Total distance - Time - **Relative speed** - Average speed.
4. **Car its weight is 5000 N** - It covers a road its length 120 Km - In a time 2 hours Degree of temperature 40°C .
5. Used in solar ovens - **Placed on the right and left sides of the car driver** - Used in front lights of cars - Used in dentists clinics.
6. Concave mirror - Convex mirror - Plane mirror - **Convex lens.**
7. **Concave lens** - Convex lens - Virtual image - Erect magnified image.
8. Erect - Equal to the body - Reversed - **Real.**
9. Fertilized ovum - **Gametes** - Zygote - Liver cell.
10. Metaphase - **Interphase** - Prophase - Anaphase.
11. Testis - **Ova** - Ovary - Anther.

12. Crossing over phenomenon - Condensing of chromatin reticulum - Nucleolus disappear - **Splitting of centromere.**

13. Yeast - **Paramecium** - Sponge – Hydra.

14. **Starfish** - Sponge - Hydra - Human.

Question 13:

Variant questions:

1. What is the simplest type of motion ?

The motion in a straight line in one direction.

2. What is the name of the device in front of you and why is it important?

Speedometer, To help us identify the speed of cars and planes directly.



3. Mention the importance of :

a) speed. **Describe and compare the motion of objects**

b) Space telescope. **To form near and clear images for the celestial bodies.**

c) Microscope. **To form magnified images for the tiny bodies that can't be seen by the naked eye.**

d) Light year. **To measure the distances between celestial bodies (as stars).**

e) Solar telescope. **It forms a complete picture for the Sun to help studying its spectra.**

f) Hubble telescope. **It collects photos of the universe that give us details about its state since millions of years.**

g) Gold nanoparticle. **absorb the light energy and convert it into heat energy, which burns and kills the infected cancer cells.**

h) Chromosomes. **1. They play a key role in cell division.**

2. They represent the genetic material of a living organism.

3. Knowing the number of chromosomes helps in identifying animal and plant species.

i) Sporangium. **It carries a large number of spores until they mature.**

g) Vegetative reproduction. **Producing new individuals identical to the parental individual without the need for seeds.**

k) Sexual reproduction. **produce new individuals that have new genetic traits that combine the parents' genetic traits.**

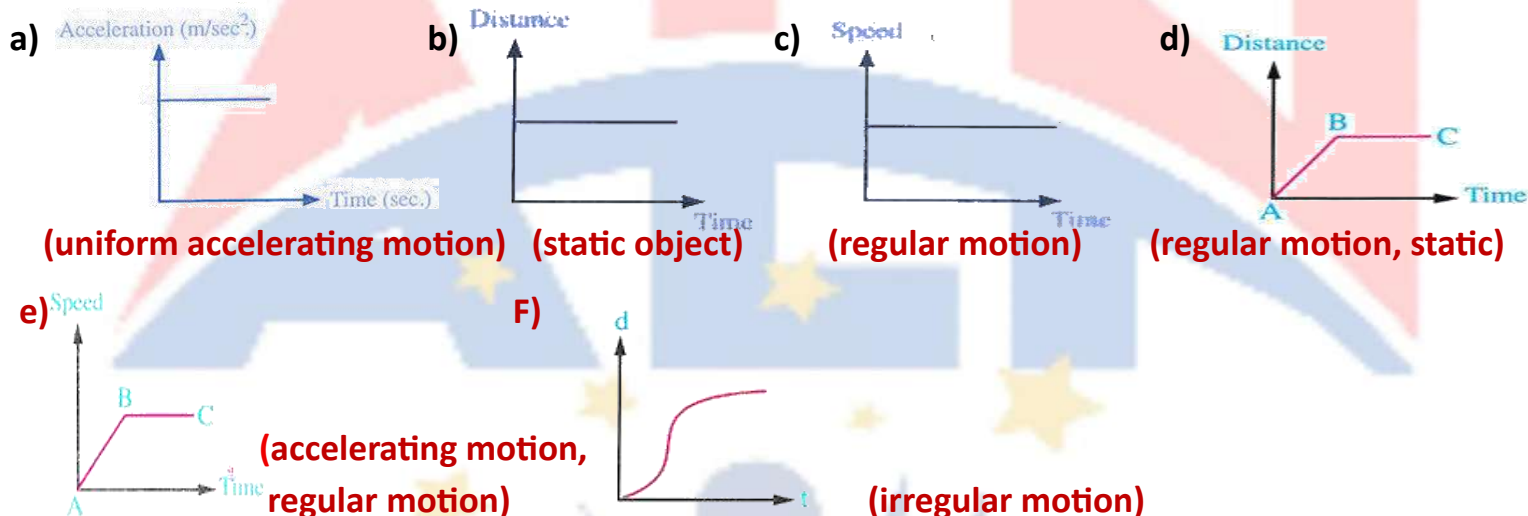
4. On recording the results of an experiment in which an object moves, the results were as follows:

Put a (✓) in front of the correct answer: This object moves at:

Distance (meter)	10	20	30
Time (second)	1	2	3

1- Uniform deceleration. 2- Uniform acceleration. 3- Uniform speed. (✓)

5. Describe the motion of the body in each of the following graphs:



6. When are the scalar physical quantities added and subtracted?

When they have the same measuring units .

7. From the diagram opposite:

Complete the path of the reflected rays in the diagram shown.

Calculate the value of the angle of reflection of the light ray on the mirror (B).

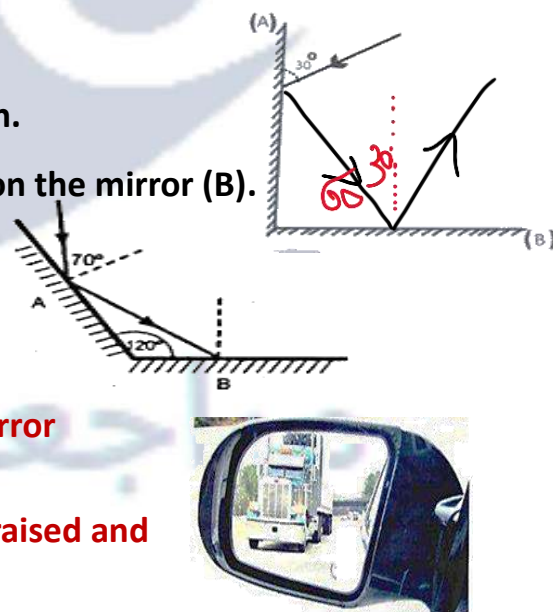
- the angle of reflection of the mirror (B). = 30°

8. From the opposite figure: Calculate the angle of reflection on the surface of mirror B. = 60°

9. From the figure opposite: 1- What type of mirror? **Convex mirror**

2- Identify some of its uses in our daily life?

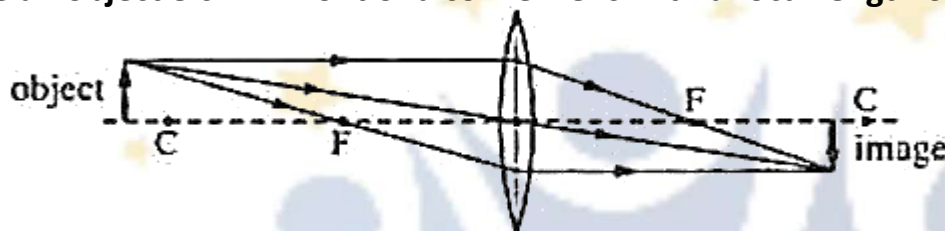
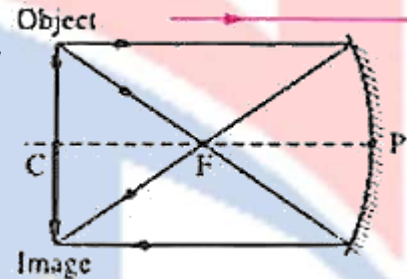
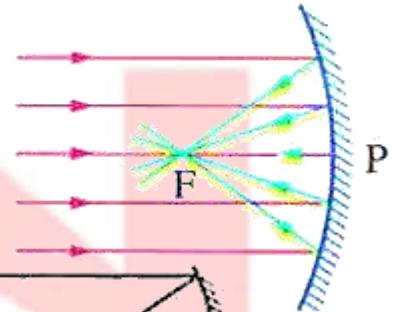
- In cars (on the right and left sides of the driver) to create a raised and diminished view of the road behind the car.
- At shopping centers to allow for a high level of security in these places.



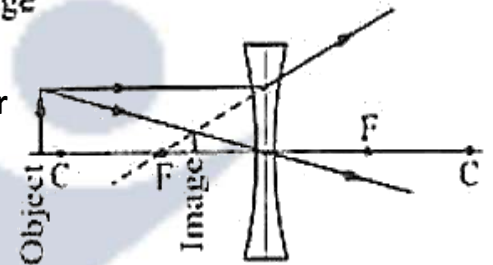
- On the corners of narrow roads to monitor car movement at these narrow intersections to avoid accidents.
- At car parks to monitor car movement in the park to avoid accidents.
- At the platforms of metro and railway stations to prevent passenger injury when opening or closing the doors

10. Explain by drawing...?

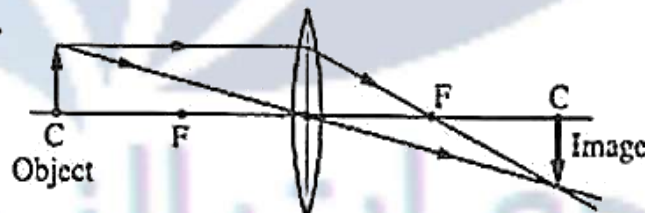
- a) The path of the rays formed by the sun through a concave mirror.
- b) The path of the rays formed by an object placed 7 cm away from a concave mirror with a radius of curvature of 14 cm.
- c) Place an object 8 cm in front of a convex lens with a focal length of 3 cm.



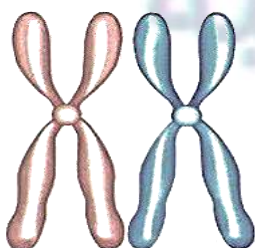
- d) Place an object in front of a concave lens at a distance greater than its focal length and less than twice its focal length.



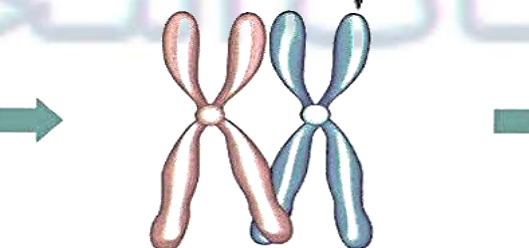
- E) The formation of an image equal to the object by means of a convex lens.



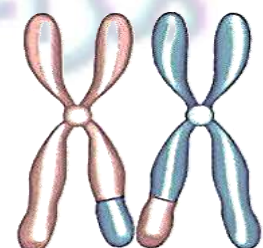
- h) Steps of crossing over.



A tetrad



The inner chromatids of homologous chromosomes crossing over each other



Exchange of some parts of the two inner chromatids in the tetrad

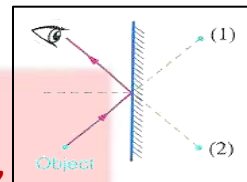
i) Anaphase in meiosis I.



11. Study the opposite figure, then determine:

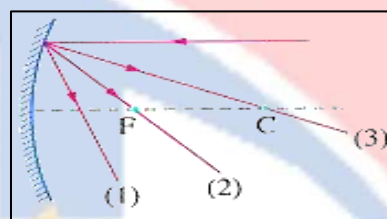
At which positions (1) or (2), does the image of the object appear? Give a reason.

Position (2), because the eye sees the object at the extension of the reflected ray, and the distance of the image from the mirror equals the distance of the object from the mirror, also the straight line connecting between the object and its image is perpendicular to the surface of the mirror.



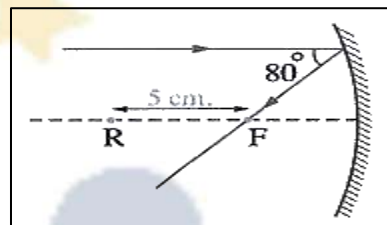
12. Study the following figure, then answer:

The reflected ray takes the path **number (2)**



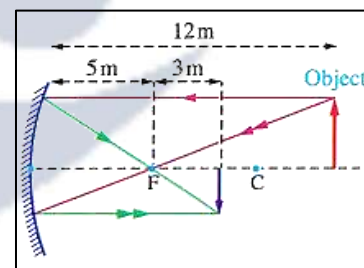
13. In the opposite figure, complete:

- The focal length equals **5 cm**
- The diameter of curvature of the mirror equals **20 cm**
- The angle of incidence equals **40 °**

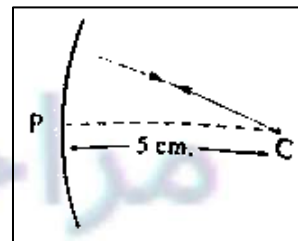


14. In the opposite figure:

- a) Calculate the distance that the object moves towards the mirror in order to form a real, inverted, and equal image. **(2 cm)**
- b) The distance the object must move so light rays are reflected parallel to each other = **7 cm towards the mirror**



15. In the opposite figure: on placing an object in front of the reflecting surface of the mirror at a distance of 6 cm from its pole, the ratio between the length of the image formed by the mirror to the length of the object is **(less than 1)**



16. If you have (concave mirror/convex lens/convex mirror/planar mirror/concave lens), which one can be used to obtain:

- a) an inverted image equal to the object. **concave mirror/convex lens**
- b) Upright image that is smaller than the object. **convex mirror/ concave lens**

- c) Virtual image equal to the object. **planar mirror**
- d) A real magnified image. **concave mirror/convex lens**
- e) a virtual, upright, and enlarged image on the other side of the object, only if the object is placed at a distance less than its focal length. **convex lens**

17. Explain each of the following by an experiment:

- a) The first law of light reflection.

Materials: A plane mirror, White paper sheet, Pins, Protractor, Ruler.

steps: 1. Draw a straight line (XY) on the white paper, then fix the plane mirror in a perpendicular position on the line (XY).

2. Draw a line (OD) [which represents the normal] perpendicular on the line (XY).

3. Draw a straight line (AO) [which represents the incident light ray] making an angle of incidence, then place two pins (P1) and (P2) on the line.

4. Look at the other side of the mirror and see the images of pins (P1') and (P2'), then place two pins (P3) and (P4) to be on a straight line with (P1') and (P2'), and connect their positions with a straight line to meet the reflecting surface at point (O), represents the reflected light ray (BO) makes with the normal angle of reflection(measure it using the protractor).

5. Repeat these steps by changing the value of the incidence angle

Observation & Conclusion: * First law: Angle of incidence = Angle of reflection

- b) Determination of the focal length of the concave mirror.

Materials: concave mirror, screen, far light source (such as the Sun).

Steps: 1. Place a concave mirror facing the Sun rays

2. Move the screen in front of mirror to obtain the smallest and clearest image.

3. Measure the distance between the lit point and the pole

Observation & Conclusion: 1- The parallel light rays coming from the Sun are reflected and collected in a lit point, "The focus of the mirror."

2. The distance between the focus and pole is called "The focal length of the mirror."

- b) Show an activity for the determination of the focal length of the convex lens.

- Materials: convex lens, light source, screen

steps: 1. place the light source facing one of lens faces.

2. Move the screen until you get the lit point.

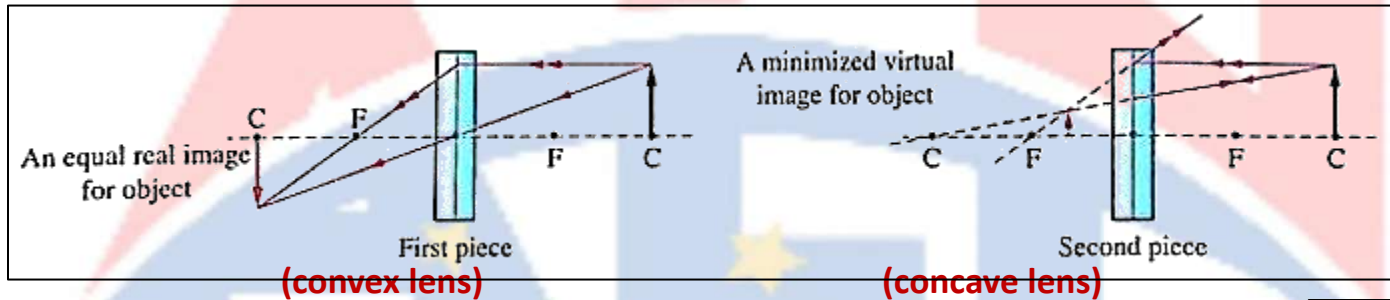
3. Measure the distance between the lit point and the optical center

Observation & Conclusion: 1. A convex lens is a converging lens.

2. The point of collection of the parallel rays after reflection from the convex lens is called the focus (F) of the lens.

3. The distance between the focus of the lens and its optical center is called the focal length (f).

18. Study the following cases, then mention the name of each optical piece:



19. What material can contact lenses be made of? What are they used for?

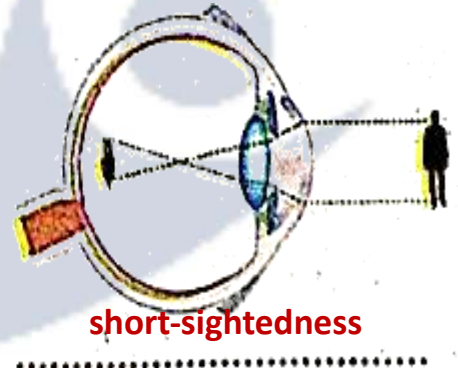
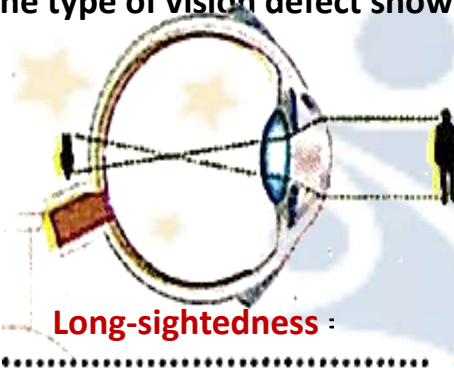
Made of transparent plastic.

- they are used instead of the medical glasses to treat the vision defects.

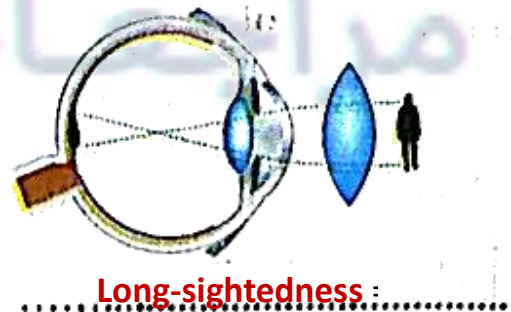


20. Study the following two diagrams carefully, and then identify:

a) the type of vision defect shown in the diagram:



b) the type of vision that has been corrected as shown in the diagram:



21. Mention the number which indicates:

- Number of galaxies in the universe. (**100,000 millions**)
- The distance covered by light through three light years. (**2.838×10^{13} Km**)
- The Sun was born. (**10,000 millions years**)

22. The opposite figure represents one of the processes that occurred in the universe:

- The rising of the dough? **expansion of universe.**
- The spacing of the raisin grains? **distances between galaxies.**



23. According to the Big Bang theory, arrange the following events from oldest to newest:

- The formation of the solar system. (3)
- The formation of the ancestors of galaxies. (2)
- The beginning of the first life on Earth. (4)
- The coalescence of matter to form larger masses. (1)

24. Re-arrange the following events in the assumptions of nebular theory from oldest to latest:

- The nebula gradually lost its heat, so its size contracted and its revolving speed increased. (1)
- The solar system originated from a glowing gaseous sphere rotating around itself. This sphere is called a "nebula". (4)
- The gaseous rings cooled down and froze, forming the planets of the solar system, and the flaming mass that remained in the center formed the "Sun". (3)
- The nebula lost its sphere shape and became a flat, rotating disk, with some parts separating to form gaseous rings. (2)

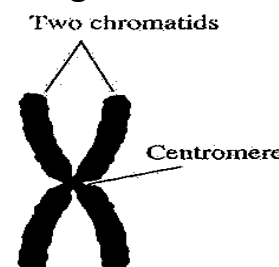
25. Mention the assumptions of the modern theory for the origin of the solar system.

- 1. A star was rotating near the Sun.**
- 2. The star exploded due to huge nuclear reactions.**
- 3. The force of the explosion led to:**
The bombing of the star's nucleus away from the gravity of the Sun.
A gaseous cloud from this star remained around the Sun.
- 4. The gaseous cloud underwent cooling and contraction processes, forming the matter of planets.**
Then, the gravitational force of the Sun controlled the orbits of planets around it.

26. Mention the general structure of the chromosome, show your answer by drawing and label it.

Each chromosome consists of:

- Two connected threads, each thread is called a "chromatid".
- The two chromatids are connected at a point known as a "centromere".-



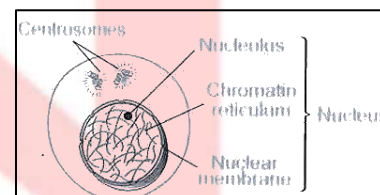
27. Two cells in a plant divide, one in the stem and the other in the ovary.

Given that the number of chromosomes in each cell is 8 pairs, state:

- The type of division that occurs in each cell. **In the stem (mitotic), but in the ovary (meiotic)**
- The type of reproduction in plants. **By using the stem (asexual, vegetative), by using seeds (sexual)**
- The number of chromosomes in the cells resulting from each cell division.
In the stem (mitotic, 8 pairs (16) of chromosomes), but in the ovary (meiotic, 8 chromosomes)

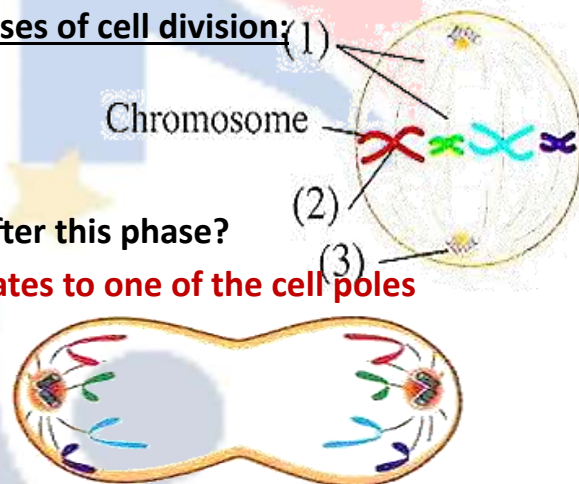
28. Look at the following figure, then answer:

- What is the name of the phase represented by that figure? **interphase**
- When does this phase occur? **Before the cell division**



29. Look at the opposite figure which represents one of the phases of cell division:

- What is the name of this phase? **metaphase**
- What type of cell division does it belong to? **Mitotic division**
- What happens to the two chromatids of each chromosome after this phase?
it will split lengthwise to form 2 identical groups each one migrates to one of the cell poles
- In which type of cell does such division occur? **Somatic cells**
- Draw the diagram of the following phase.
- How was the structure of number (1) formed?
it is formed at the centrosomes, extending between the two poles of the cell.
- Write the number which refers to the centromere. **Number (2)**

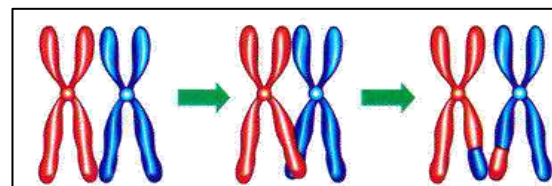


30. What are the steps that chromosomes go through for crossing-over phenomenon to occur?

- **at the prophase I in meiotic cell division: - Chromosomes are arranged in homologous pairs, each pair consists of 4 chromatids which are called a tetrad.**
- **The inner chromatids of a tetrad cross over each other**
- **some parts of the two inner chromatids of each tetrad are exchanged to produce new genetic arrangements.**

31. Note the following figure about crossing over phenomenon then answer:

- Complete:** It takes place between the two **inner chromatids** of each tetrad.
- When does it occurs? **At the end of the prophase I in meiotic cell division during the formation of gametes**
- What is its importance?



- It works on the variation of genetic traits among the members of the same species, where it contributes to the exchange of genes (that carry genetic traits) between the two homologous chromosome's chromatids, and distributes them randomly in the gametes.

32. From the opposite figure, answer the following:

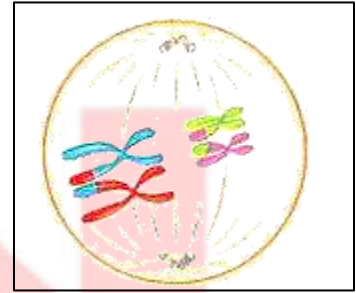
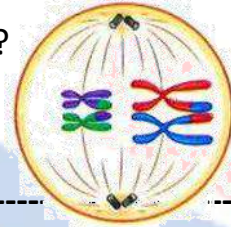
a. What is the name of the division phase represented by this figure?

The end of prophase I in first meiotic cell division

b. What is the most important phenomenon that occurs in it?

crossing over phenomenon

c. Draw the diagram of the phase next to this one.

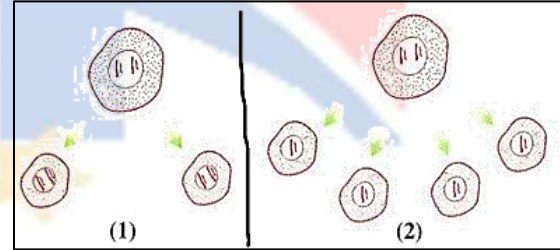


33. The two opposite figures illustrate the division of two cells in two different ways:

a) Mention the type of division that occurs in each of the two methods, explaining where they occur?

(1) mitotic cell division, It occurs in somatic cells except neural cells and red blood cells.

(2) Meiotic cell division, It occurs in reproductive cells.

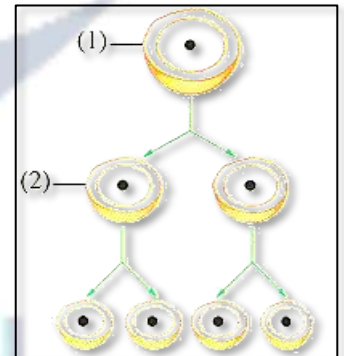


b) Mention the number of chromosomes in each cell resulting from the division in each of the two methods, knowing that the number of chromosomes in the mother cell is 20 chromosomes.

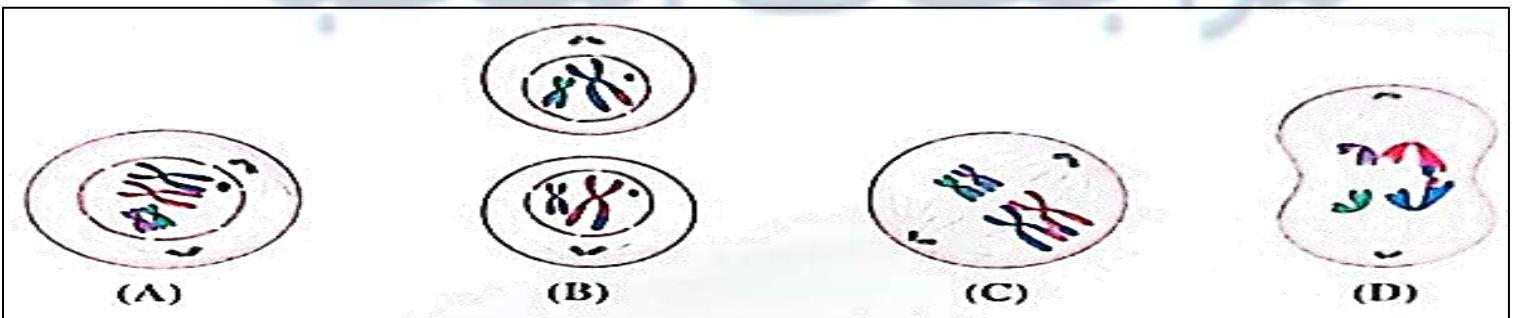
(1) mitotic cell division, is 20 chromosomes, (2) Meiotic cell division, , is 10 chromosomes

34. Study the opposite figure, then answer: If the number of chromosomes in cell (1) is 16, how many chromosomes are in cell (2)?

8 chromosomes



35. The following microscopic images illustrate the first meiotic division phases:



1. Identify each phase. **(A) prophase I, (B) telophase I, (C) prophase II, (D) anaphase I**
2. Arrange these phases according to the priority of occurrence. **(A), (D), (B), (C)**

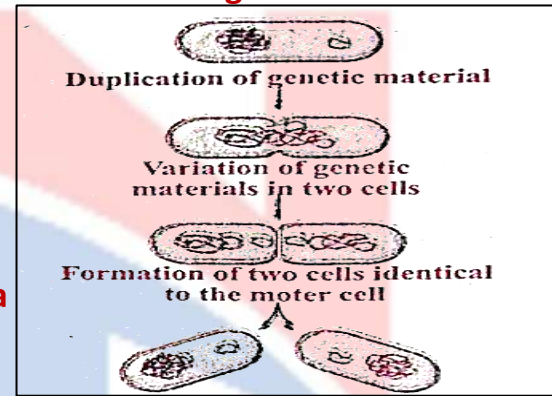
36. Explain: Mitotic divisions differs from second meiotic division although they are similar in their phases. **Because the mitotic cell division occurs in cells containing 2N chromosomes and before it interphase occurs , but in the second meiotic division occurs in cells containing N chromosomes and before it interphase doesn't occur .**

37. - Note the following figure then answer:

-The opposite figure shows reproduction by **binary fission**

It occurs in some organisms such as **bacteria,**

simple algae and protozoa such as **Amoeba - Paramecium - Euglena**



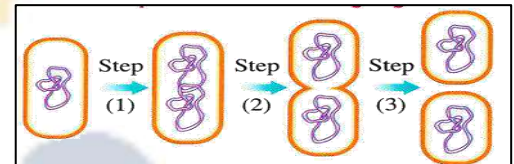
38. The opposite figure represents one type of asexual reproduction in a living organism:

a. Mention the steps of this type of asexual reproduction in this organism as shown in the figure in:

step (1) **The genetic material is doubled.**

step (2) **The genetic material distributes equally into two cells.**

step (3) **Two identical cells are produced, each is identical to the parent cell.**

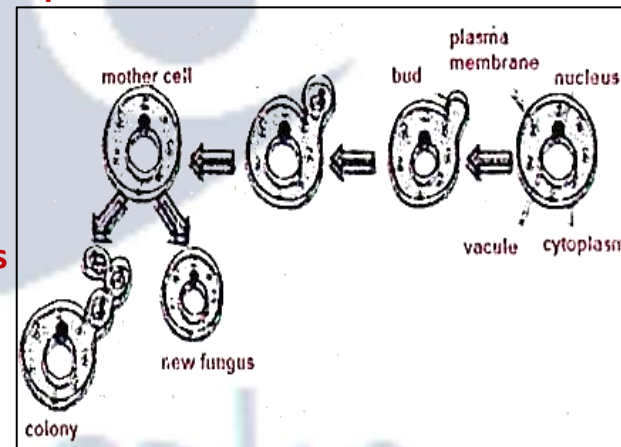


39. -Note the following figure then answer:

-The figure illustrates reproduction by **budding**

-It occurs in unicellular organisms such as **Yeast fungus**

-It occurs in multicellular organisms such as **Hydra and sponges**

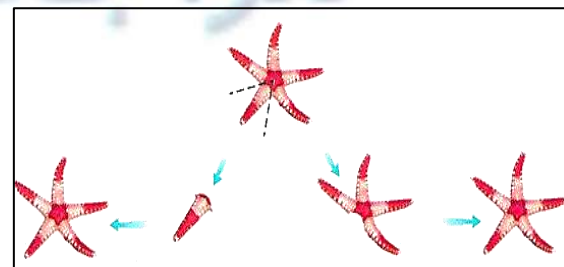


40. -Note the following figure then answer:

-The figure illustrates reproduction by **regeneration**

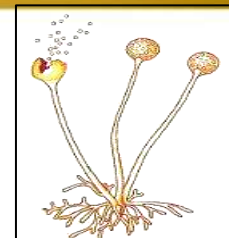
-When a starfish loses one of its arms, which contains

part of the central disc, the process of **regeneration** occurs for the starfish, and the process of **reproduction by regeneration** occurs for the lost arm to form a new starfish.



41. -Note the following figure then answer:

- The figure shows reproduction by **Sporogony** or **Spore propagation**
- This type of reproduction occurs in **Some fungi** such as **Bread mold fungus and mushroom fungus**



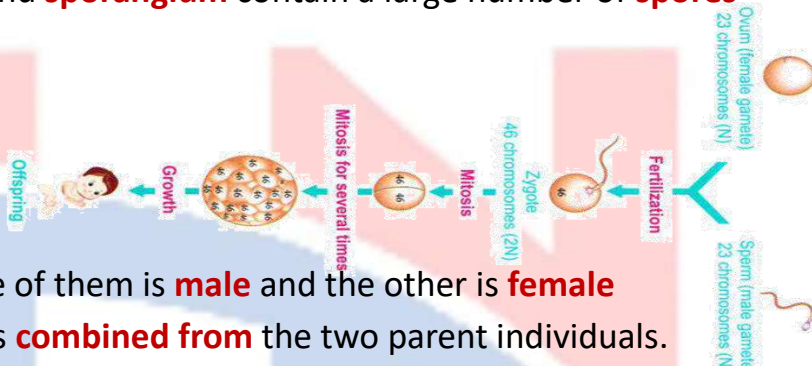
- which contain special organs called **sporangia** and **sporangium** contain a large number of **spores**

42. Note the following figure, then answer:

- The opposite figure shows **sexual** reproduction
- It depends on two basic processes, which are

Gamete formation & fertilization

- It is carried out by two **parental** individuals, one of them is **male** and the other is **female**
- The resulting new individuals have genetic traits **combined from** the two parent individuals.

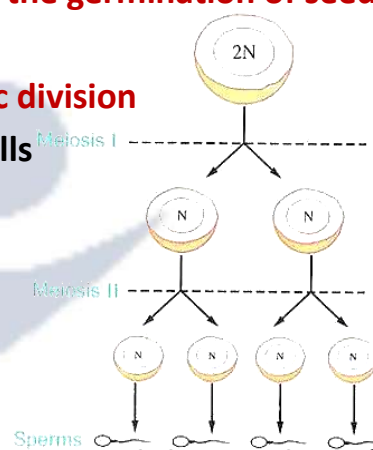


43. What is the relationship between the genetic structure of the offspring and the parents in the following cases? Explain the reason in each case:

- 1- Binary fission in Paramecium. - **The resulting cells are identical to the parental cell.**
- **Because they are resulted from asexual reproduction and depend on mitotic division**
- 2- Plant resulting from seed germination. - **The offspring resulting from the germination of seeds has new genetic traits that combine the parent's traits.**
- **Because it results from sexual reproduction and depends on meiotic division**

44. Explain with a diagram how gametes are formed from reproductive cells through meiotic division.

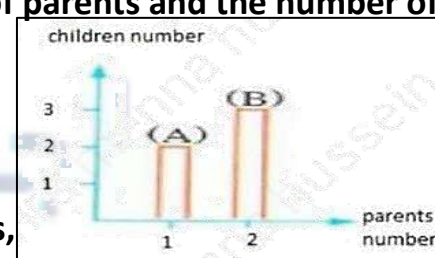
- **Gametes of a male and a female are formed in the living organism as a result of the meiotic division of its reproductive cells.**
- **Gametes contain half the number of chromosomes (N) of the organism's reproductive or somatic cells (2N).**



45. The opposite graph shows the relationship between the number of parents and the number of children for two cases of reproduction:

What is the type of reproduction in each of the two cases A and B?

Case (A) = asexual Case (B) = sexual



46. A testicular wall cell in a human male underwent several divisions, resulting in 256 cells. In light of this, answer the following:

- a- How many divisions occurred? And what type? **4 times, meiotic cell division**
- b- How many chromosomes are in the total number of resulting cells?

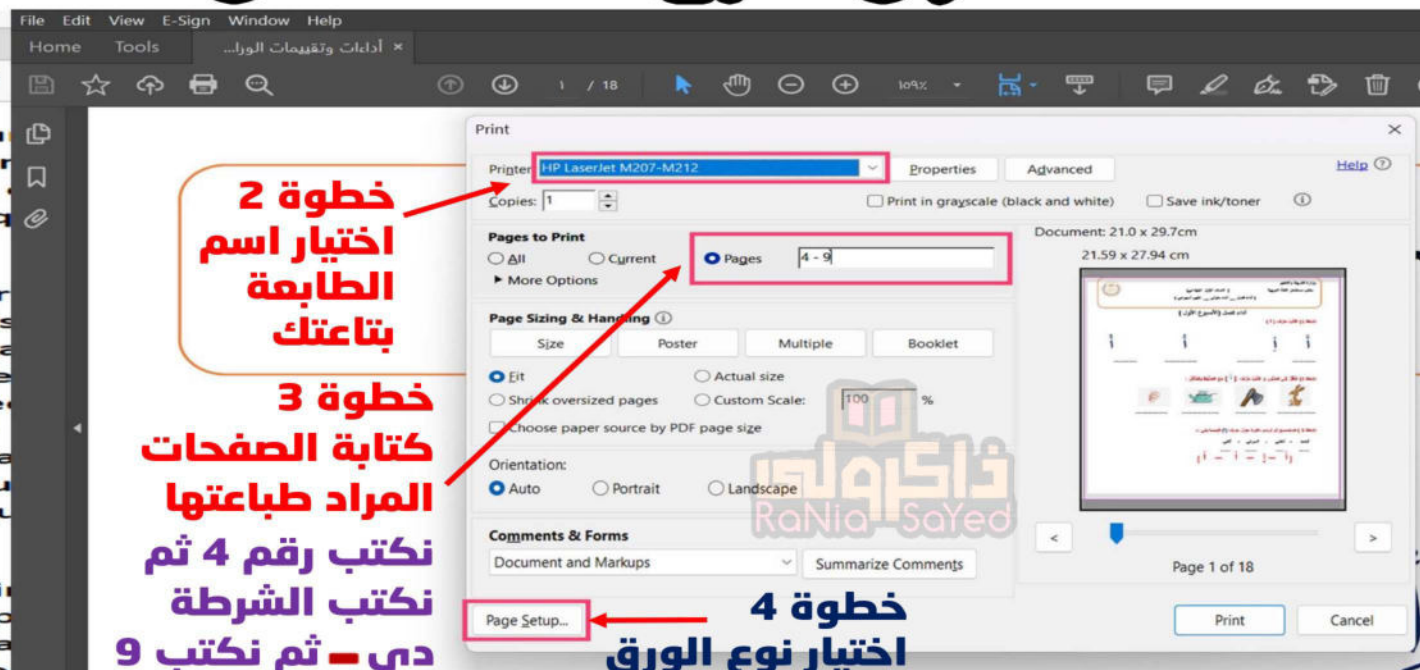
half (N) number of chromosome which found in parent cell = 23, for all cells = $23 \times 256 = 5888$

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



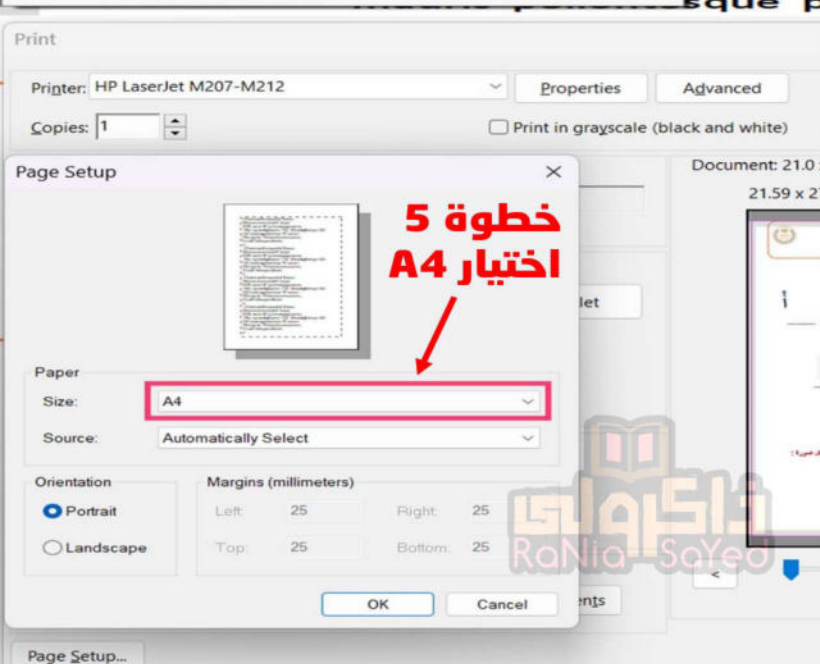
خطوة 1



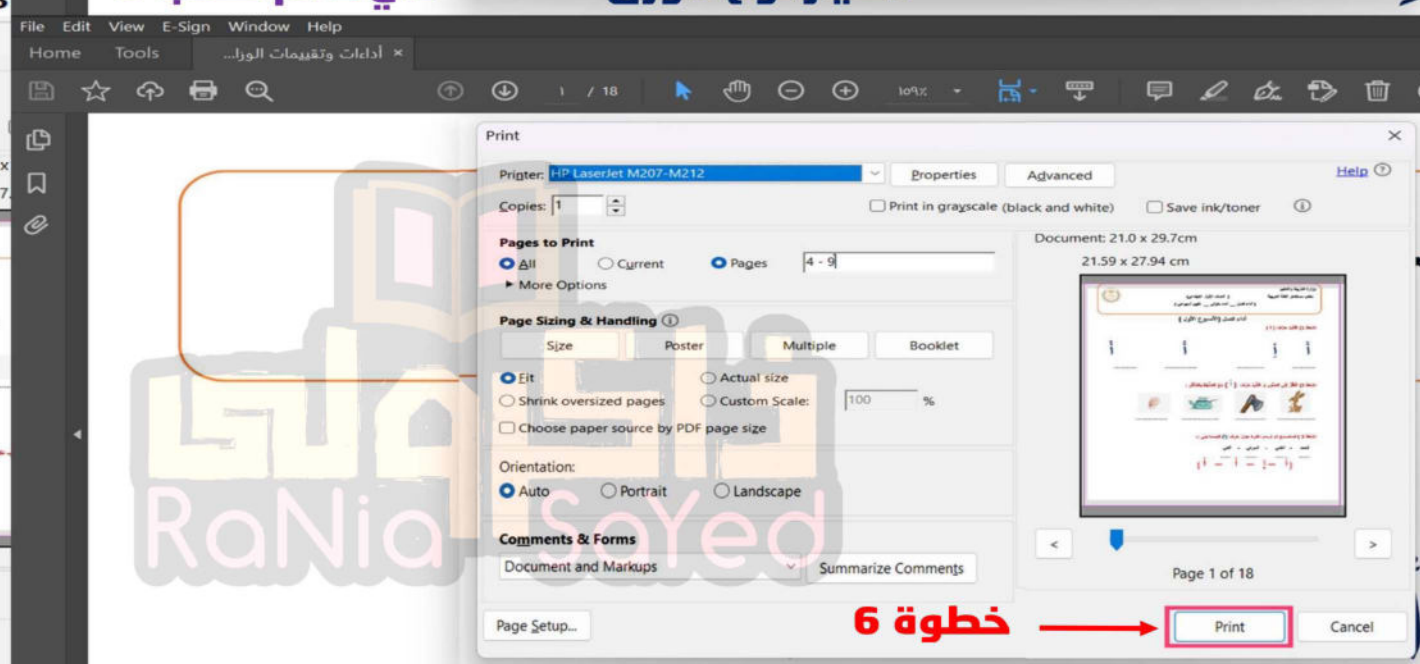
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6

حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الاول





Final Revision

★ (1) Write the scientific term:

Mr. Ahmed Elbasha

- 1) The distance moved through a unit time. (.....)
- 2) The combination of the male gamete and female gamete to form a zygote. (.....)
- 3) The space which contains all the galaxies, stars, planets and living organisms. (.....)
- 4) It is the speed by which the object moves when it covers equal distances at equal periods of time. (.....)
- 5) An optical piece is thin at its center and more thick at the tips and diverging light rays falling on it. (.....)
- 6) Asexual reproduction takes place in some plants without needing seeds but through their vegetative organs. (.....)
- 7) A group of stars that rotate together in cosmic space by the effect of gravity. (.....)
- 8) The angle between the reflected light ray and the normal line at the point of incidence on the reflecting surface. (.....)
- 9) Fusion of the male gamete and the female gamete to form the zygote. (.....)
- 10) The speed of an object relative to an observer. (.....)
- 11) The force that controls the orbits of the planets around the Sun according to the modern theory. (.....)
- 12) Specialized cells which produce gametes. (.....)
- 13) Changing the position of an object as the time passes according to a fixed point. (.....)
- 14) A point inside the lens that lies on the principal axis at mid distance between the faces of the lens. (.....)
- 15) Something that includes all galaxies , stars, planets and living organisms. (.....)

- 16) The rebounding of the light to the same side when it strikes a reflecting surface. (.....)
- 17) It is located in one of the spiral arms of the Milky Way galaxy on the edge of the galaxy. (.....)
- 18) A medical case as a result of the formation of the image behind the retina. (.....)
- 19) The total distance that a moving object covers divided by total time taken to cover this distance. (.....)
- 20) The object's speed changes (increases or decreases) by equal values through equal periods of times. (.....)
- 21) A biological process, where the living organism produces new individuals of the same kind and thus, ensuring its continuity. (.....)
- 22) The angle between the incident light ray and the perpendicular line on the reflecting surface from the point of incidence. (.....)
- 23) The nucleic acid that carries the genetic traits of the living organism. (.....)
- 24) A mirror, always forms a diminished image for the object. (.....)
- 25) The displacement in one second. (.....)
- 26) The ability of some animals to compensate their missing parts. (.....)
- 27) The point of connection of the two chromatids in a chromosome. (.....)
- 28) line that passes through the optical center of the lens without passing through the two centers of curvature of its faces . (.....)
- 29) The distance between the pole of a spherical mirror and its center of curvature. (.....)
- 30) The speed of a moving body that covers equal distances at unequal time intervals. (.....)
- 31) The speed of a moving object relatively to a constant or a moving observer. (.....)
- 32) The mirror, whose reflecting surface is a part of the inner surface the sphere. (.....)
- 33) A point inside the lens lies on the principal axis in the mid distance between its faces. (.....)

- 34) The nucleic acid that carries the genetic traits of the living organisms. (.....)
- 35) Bouncing of the light to the same side when it strikes a reflecting surface. (.....)
- 36) The straight line that passes by center of curvature of the mirror and its pole. (.....)
- 37) A glowing gaseous sphere formed the planets of the solar system. (.....)
- 38) It's a mirror that its reflecting surface is a part of a hollow sphere. (.....)
- 39) The mid-point on the reflecting surface of the mirror. (.....)
- 40) The part in the cell which is responsible for cellular division. (.....)
- 41) The incident light ray, the reflected light ray and the normal line all lie in the same plane perpendicular to the reflecting surface. (.....)
- 42) The combination of a male gamete and a female gamete to form a zygote. (.....)
- 43) A type of asexual reproduction that occurs in simple algae. (.....)
- 44) A phase in which some important vital processes occur to prepare the cell for division and the amount of genetic material duplicates. (.....)
- 45) It is a theory that explains the origin of the universe from a massive explosion since 15000 million years. (.....)
- 46) The mass of cells which result from the abnormal cell when it is continually divided without controlling. (.....)
- 47) It is a very thin plastic lenses and can stick to the eye cornea. (.....)
- 48) A disease that infects the eye lens and it becomes opaque. (.....)
- 49) A vector quantity that equals the displacement in one second. (.....)
- 50) Chemically consists of DNA and protein. (.....)

- 51) Fibers extend between the two poles of the cell in prophase. (.....)
-
- 52) The image that cannot be received on the screen. (.....)
-
- 53) A theory assumed that the solar system was originally a big star which is the Sun. (.....)
-
- 54) A flat gaseous round disk that formed the solar system planets according to the perception of "Laplace" scientist. (.....)
-
- 55) A cell division that occurs in the somatic cells and results in the growth of the living organism. (.....)
-
- 56) The actual length of the path that a moving object takes from the starting point of movement to the end point. (.....)
-
- 57) It is located in one of the spiral arms of the Milky Way on the edge of the galaxy. (.....)
-
- 58) The line between the two centers of curvature of the lens passing by the optical center of the lens. (.....)
-
- 59) The phase which the cell prepares to division by the genetic material (DNA) duplicates. (.....)
-
- 60) The displacement covered through a unit time . (.....)
-
- 61) The point of connection of two chromatids of the chromosome together. (.....)
-
- 62) A type of asexual reproduction that takes place in plants' vegetative organs without the need of seeds. (.....)
-
- 63) A theory based on an astronomical phenomenon in which a star was glowing for a short time , and then its glowing disappears gradually. (.....)
-
- 64) The value of an object's speed relative to the observer. (.....)
-
- 65) The total distance covered by a moving body divided by the total time. (.....)
-
- 66) The physical quantity that has magnitude only and has no direction . (.....)
-
- 67) A mirror can be used to get virtual, upright and magnified image of an object. (.....)

- 68) Angle of incidence of the light ray equals its angle of reflection. (.....)
-
- 69) A mirror used to form virtual, upright and diminished image. (.....)
-
- 70) The line that joins between the two centres of curvature of the lens passing by the optical centre of the lens. (.....)
-
- 71) Half the diameter of the sphere, where the face of the lens is a part of it. (.....)
-
- 72) It is the point of collection of the refracted light rays or their extensions which are produced, when the light rays fall parallel to the principal axis of a lens. (.....)
-
- 73) Seeing the near objects clearly and seeing the far objects distorted. (.....)
-
- 74) A flat gaseous round disk that formed the solar system. (.....)
-
- 75) The biggest star that can be seen by people clearly on the Earth. (.....)
-
- 76) The scientist who established the nebula theory. (.....)
-
- 77) A theory assumed that the solar system was originally the Sun. (.....)
-
- 78) The unit which is used for measuring the distance between celestial bodies. (.....)
-
- 79) It is a wide and extended space that contains all the galaxies, stars and planets. (.....)
-
- 80) A theory explains the origin of the universe from a massive explosion since 15000 million years. (.....)
-
- 81) The theory that is explained the formation of the galaxies and the stars. (.....)
-

***(2) Choose the right answer:**

1. The crossing over phenomenon takes place at the end of
a. prophase I. b. metaphase I. c. anaphase I. d. telophase I.
2. The ability of some animals to compensate their missing parts is called the
a. budding. b. regeneration. c. sporogony. d. sexual reproduction.
3. The line between the centers of curvature of the lens passing by the optical centre of the lens is called the
a. focal length. b. principal axis. c. secondary axis. d. radius of curvature.
4. If the speed of a car is 72 km/hour, this means that its speed equals m/s.
a. 18 b. 20 c. 40
5. The spindle filaments appear during cell division in
a. telophase . b. interphase. c . prophase.
6. The image of the object that lies at the center of curvature of a concave mirror is ...
a. real, inverted and enlarged.
b. real , upright and equal to the object.
c. real, inverted and equal to the object.
d. virtual, upright and equal to the object.
7. If the chromosomal number in the male gamete of an organism is 20 so, the chromosomal number in the liver cell equals
a. 5 chromosomes. b. 10 chromosomes. c. 20 chromosomes. d. 40 chromosomes.
8. established the crossing star theory.
a. Laplace b. Fred Hoyle c. Hubble d. Chamberlain
9. The centromere of each chromosome divides longitudinally and the spindle fibers contract in mitosis during
a. prophase. b. metaphase. c. anaphase. d. telophase.
10. The number of chromosomes in the gamete is the number of chromosomes in the original cell.
a. equal to b. half c. quarter d. double
11. When the body covers equal distances at unequal periods of time, the speed will be ...
a. regular. b. decelerated. c. accelerated. d. irregular.
12. All the following cells contain full copy of genetic material except
a. spore. b. bud. c. zygote. d. pollen grain.
13. The uniform acceleration means that the object speed by equal values through equal periods of time.
a. increases only b. decreases only
c. increases or decreases d. doesn't change
14. From the scalar physical quantities is the
a. acceleration. b. time. c. velocity. d. displacement.

- a. it moves at a constant acceleration.
- b. it covers equal distances at unequal times.
- c. it covers equal distances at equal times.
- d. no correct answer.

a. more than 40 cm. b. more than 20 cm and less than 40 cm.
c. equals 20 cm. d. equals 60 cm.

a. regeneration. b. binary fission. c. budding. d. spore.

a. 7 b. 8 c. 9 d. 10

a. convex lens
b. concave mirror
c. plane mirror
d. convex mirror and concave lens

a. regular b. average c. vector d. relative

a. 3 b. 6 c. 9 d. 12

a. 8 b. 16 c. 24 d. 32

a. convex lens b. concave lens c. spherical mirror d. plane mirror.

a. average speed. b. relative speed. c. uniform speed. d. irregular speed.

a. Chamberlin. b. Laplace. c. Fred Hoyle. d. Molten.

a. real, inverted and diminished. b. real, inverted and enlarged.
c. virtual diminished. d. virtual enlarged.

27. An observer in a moving car with 80 km/h was observing a moving car with 90 km/h in the same direction so, the observed speed of the 2nd car is
a. 10 km/h . b. 80 km/h. c. 90 km/h. d. 170 km/h.
-
28. The is the phase in which the cell is prepared for division by doubling the genetic material .
a. prophase b. interphase c. metaphase d. anaphase
-
29. A concave mirror has a focal length of 8 cm. An object is placed in front of this mirror forming an image at a distance 20 cm from the mirror. This means that the object is placed at from the mirror.
a. 8 cm. b. less than 8 cm.
c. 20 cm. d. more than 8 cm. and less than 16 me.
-
30. A doctor advised a person who has a sight defect to use glasses with convex lenses. It means that this person suffers from
a. a decrease in the convexity of the eye lens surface.
b. an increase in the convexity of eye lens surface.
c. an increase in the eyeball diameter.
d. disability of seeing far objects clearly.
-
31. Reproduction by spores occurs in all the following organisms, except
a. starfish. b. fungus. c. bread mould. d. mushroom.
-
32. One of the vector physical quantities is
a. time of a car trip. b. length of a pen.
c. mass of a cat. d. force by which person pushes a stone.
-
33. A short sighted person sees the far objects distorted as their images formed
a. on the retina. b. behind the retina.
c. in front of the retina. d . in front of the lens .
-
34. From examples of the scalar physical quantities is
a. the velocity. b. the mass. c. the force . d. the acceleration.
-
35. The cell that never divide is
a. adult red blood cells. b. the stomach.
c. the liver. d. the skin.
-
36. Paramecium is a protozoan that reproduces by
a. spores. b. budding . c. regeneration. d. binary fission .
-
37. reproduction which considered as a source of genetic variation is reproduction.
a. vegetative b. budding c. sexual d. regeneration
-
38. The scientist who established the nebular theory is
a. Chamberlain . b. Moulton. c. Fred Hoyle. d . Laplace.
-
39. (Speed - time) graph for a regular motion at a constant speed is a straight line is
a. curved . b. passing by the origin point.
c. parallel to x-axis. d. parallel to y-axis.

40. When an object is placed to face a convex mirror, the image formed is
a. lies behind the mirror. b. is real.
c. is erect. d. (a) and (c).
41. Fred Hoyle relates controlling the Sun in the orbits of the planets around it to of the Sun.
a. temperature b. rotation speed c. attraction force d. glowing
42. The chemical structure of the chromosome is
a. the nucleic acid only. b. protein and nucleic acid.
c. protein, fats and nucleic acid. d. all the previous.
43. The two gases which produced galaxies, stars and universe through millions of years are
a. oxygen & helium. b. helium & hydrogen.
c. oxygen & carbon dioxide. d. helium & carbon dioxide.
44. The universe contains
a. galaxies & stars. b. planets and moons .
c. living organisms. d . all the previous.
45. From the properties of the image formed by a convex mirror is
a. virtual. b. real. c. upright. d. (a) and (c) together.
46. If a person stands at a distance 2 m from a plane mirror, the distance between the person and his image is
a. 1 m. b. 2 m. c. 3 m. d. 4 m.
47. The value of change of an object speed in one second is called
a. velocity. b. displacement. c. acceleration. d. speed.
48. Our solar system is located in one of the arms of the Milky way galaxy.
a. spiral b. straight c. circular d. oval
49. From the scalar quantities
a. the time. b. the force. c. the acceleration. d . the displacement.
50. Spindle fibers appear during the cell division in the
a. telophase. b. interphase. c. prophase. d. metaphase.
51. When an object acceleration equal zero this means that
a. the body acceleration is decreasing. b. the body speed is variable.
c. the body acceleration is increasing. d. the body speed is uniform.
52. Within minutes of the Big Bang, the percentage of hydrogen in the universe was
a. 25% b. 50% c. 75% d. 100%
53. The distance and displacement are equal when the body moves in a in one direction.
a. zigzag b. circular c. straight line d. curved
54. The two factors in which the movement of an object can be described
a. speed and time. b. distance and time. c. area and time.

- 55. Property of the image of the object formed by the plane mirror always be**
a. larger than the object. b. equal to the object. c. smaller than the object.
-
- 56. scientists believe that the universe emerged from massive explosion and it is in**
a. continues contraction. b. contraction then expansion.
c. expansion then contraction. d. continues expansion .
-
- 57. If a light ray falls passing through the optical centre of the convex lens, it leaves the lens**
a. passing through the focus. b. parallel to the principal axis. c. without refraction.
-
- 58. The continuous expansion of the universe, is due to**
a. separation of galaxies. b. approaching of galaxies. c. equivalent to galaxies.
-
- 59. The founder of modern theory of the solar system is scientist.**
a. Moulton b. Chamberlain c. Fred Hoyle
-
- 60. The image formed by using a concave lens is**
a. real , enlarged, and inverted.
b. virtual, smaller and inverted.
c. virtual, smaller and upright.
-
- 61. At the end of this phase, the nucleolus and nuclear membrane disappear from the mitosis division**
a. prophase. b. metaphase. c. telophase.
-
- 62. When an object is placed between the focus of a convex lens and its center of curvature, the formed image will be**
a. real, inverted and diminished. b. real, inverted and magnified.
c. virtual, erect and magnified. d. virtual, erect and diminished.
-
- 63. The result of multiplying a speed of moving object by time**
a. acceleration. b. mass . c. distance. d. force.
-
- 64. began to form after 3000 million years after the Big Bang.**
a. galaxies. b. ancestral galaxies. c. the Sun. d. the Earth.
-
- 65. If the length of the radius of curvature of concave mirror 20 cm, then the focal length of the mirror equals**
a. 5 b. 10 c. 15 d. 20
-
- 66. The Milky Way galaxy took its disc form after about million years after the Big Bang.**
a. 1000 b. 3000 c. 5000 d. 10000
-
- 67. From the examples of the vector physical quantities is**
a. time. b. force . c. mass. d. length.

68.The optical piece which forms an image that inverted and equal to the object is

- a. concave lens.
 - b. concave mirror.
 - c. convex mirror.
 - d. plane mirror.
-

69.The nucleolus disappears during the mitosis cell division in

- a. prophase.
 - b. metaphase.
 - c. anaphase.
 - d. telophase.
-

70.(Distance - time) graph for an object moves at regular speed is represented by a straight line

- a. parallel to time axis.
 - b. parallel to distance axis .
 - c. passing through the origin point.
 - d. (a) and (c) together.
-

71.The source of genetic variation is the reproduction.

- a. budding
- b. vegetative.
- c. sexual.
- d . regeneration.

***(3) Complete the following:**

1. The Sun and the surrounding planets revolve around the center of galaxy.
2. Mitosis occurs in the cells of living organisms.
3. Distance is a physical quantity, while force is a physical quantity.
4. The scientist who established the modern theory about the evolution of the solar system is
5. The distance that a moving object covers within a unit time is known as
6. The incident light ray which is parallel to the principal axis of a concave mirror reflects passing through
7. The scientists believe that the matter of the universe was a ball of high pressure and high temperature.
8. The long-sighted person needs glasses of lens.
9. Vegetative reproduction in plants happens by division.
10. scientist who founded the nebular theory.
11. The spindle fibers are formed during the cell division in
12. are formed of groups of stars in the universe.
13. Acceleration is considered one of physical quantities , while time is considered one of physical quantities.
14. The solar system is located in one the arms of the Milky Way on the edge of the galaxy.
15. Somatic cells are divided by , while reproductive cells are divided by
16. In Milky Way galaxy, the old stars (the older) gather in the of the galaxy.
17. The incident light ray that passes through the focus of the convex lens, it exits from the lens
18. Mass is considered from physical quantity.
19. From the scalar physical quantities is, while is from the vector physical quantities.
20. Condensing the cytoplasm in the two poles of the plant cells forms
21. Crossing over phenomenon happens between the during the meiosis division.
22. In human and animals, meiosis occurs in to produce the male gametes, while it occurs in to produce the female gametes.

23. vision defect which is due to the decrease in the eyeball diameter is called and is corrected by lenses .
24. The two factors which can be used to describe the motion of a body are the..... and
25. The Big Bang theory explain the origin of , while the nebular theory is one of the theories which explain the origin of
26. In animal cell spindle fibers formed from , while in plant cell spindle fibers form at the poles.
27. The galaxy that solar system belongs to is called
28. The image formed by concave lens is always erect and diminished.
29. The nucleolus and nuclear membrane disappear at the end of of mitosis.
30. The change of an object position as time passes according to the position of another fixed object is called
31. The contact lenses are used instead of the and it is made of
32. The convex lens the light, while the convex mirror the light.
33. The solar system is located in one of the spiral arms of the on the
34. movement path in one direction may be , or a combination of both .
35. The cell contains the genetic material of the living organism which consists of a number of
36. When the object lies in front of lens, a virtual and diminished image is formed.
37. The yeast fungus reproduces by , while the starfish reproduces by
38. The scientist established the modern theory of evolution of the solar system.
39. The Egyptian scientist Mustafa El Said discovered a way to detect the cancer cell by using
40. A short-sighted person needs a medical eye glasses with lenses .
41. The chromosome chemically consists of nuclear acid called DNA and
42. The spindle fibers in the animal cell is formed from , while in the plant cell the spindle is composed form the at the cell poles.
43. From the examples of the multicellular organisms reproduced by budding is
44. The point that lies in the middle of the reflecting surface of the concave mirror is called

45. The displacement covered by a body in one second is called
46. Speed measuring unit is , while the measuring unit of acceleration is
47. The crossing over phenomenon occurs in of division .
48. and are types of spherical mirrors.
49. The Sun and the planets revolving around it, rotate around the center of galaxy.
50. reproduction doesn't required neither special systems nor structures in the living organisms.
51. are used instead of medical glasses to treat vision defects.
52. When the object is placed at of the convex lenses, there is no image will be formed.
53. The moving car with 50 Km/h in constant direction its speed appears at 110 Km/h related to observer moves with 60 Km/h in direction of the car motion.
54. The crossing over phenomenon occurs in of first meiosis division.
55. The solar system consists of a number of planets revolve around the Sun.
56. The physical quantity that its magnitude and direction are necessary for identifying it is called
57. A concave mirror has a focal length of 20 cm , then the radius of curvature of its spherical surface equals
58. Correcting long-sightedness by using lens and correcting short-sightedness by using lens.
59. Yeast fungus reproduces asexually by, while the amoeba reproduces asexually by
60. image can be received on a screen .
61. The stars move in a fixed orbit around the center of the
62. The measuring unit of acceleration is
63. Asexual reproduction takes place by in the yeast fungus.
64. We use lens to obtain a virtual and magnified image.
65. The straight distance covered by the object in a certain direction is called
66. The telescope is from the space telescopes.
67. The spindle fibers are formed during the cell division in
68. The double of the distance between the optical center of a lens and its focus=

69. The velocity is the in one second.
70. Force is considered physical quantity and mass is considered physical quantity.
71. two factors which can be used to describe the motion of the body are and
72. The (speed - time) graph of motion at uniform speed is represented by a line
73. The product of the speed of the body x the time =
74. If the body moves from rest, so its initial speed equals
75. is the change of an object's position as time passes according to the position of another object.
76. The graphical relation (speed - time) for regular motion at uniform speed is represented by a straight line to the time axis.
77. The secondary axis of the spherical mirror is any straight line that passes by and any point on its surface except.....
78. The short-sighted person needs a medical eye glasses with lenses .
79. vision defect which is due to a shortness in the radius of the eyeball is called
80. A point inside the lens lies on the principal axis in the mid distance between its faces is called
81. point that is in the middle of the reflecting surface of the concave mirror is called
82. The phenomenon of the light bouncing off in the same medium when it meets the reflecting surface is called
83. The scientist who established the crossing star theory is
84. The Sun takes about years to complete one rotation around
85. The stars move in fixed orbits around the center of the
86. The two gases which produced galaxies, stars through millions of years are and
87. The founder of nebular theory is

✱(4) Correct the underlined words:

1	The solar system includes <u>nine</u> planets revolve around the Sun.	.....
2	The chromosome consists of two chromatids connected at the <u>cytoplasm</u>.	.....
3	Nebular theory suggested that the solar system originated from a glowing gaseous sphere revolving around the <u>Sun</u>.	.....
4	The two gases which produced the galaxies, stars and universe over millions of years are helium and <u>nitrogen</u>.	.....
5	The relative speed of a moving car to an observer at rest is <u>less than</u> the real speed .	.....
6	Reproduction by spore propagation occurs in <u>paramecium</u>.	.....
7	Meiosis happens in the <u>somatic cells</u>.	.....
8	The formed image by the plane mirror is <u>real and inverted</u>.	.....
9	The Sun takes about <u>100</u> million years to complete one rotation around the center of the galaxy.	.....
10	If the speedometer points to 72, this is equivalent to <u>15</u> m/s.	.....
11	In <u>convex</u> mirror, the image is inverted and equal to the object.	.....
12	Many scientists believe that the universe emerged from a massive explosion <u>500 thousand years</u> ago .	.....
13	The chromosomes chemically consists of nuclear acid called (DNA) and <u>fats</u>.	.....
14	If the radius of curvature of a concave mirror equals 20 cm. its focal length will be <u>30</u> cm.	.....
15	In meiotic cell division, Crossing over phenomenon occurs at the end of <u>Anaphase 1</u>.	.....
16	The scientist <u>laplace</u> assumed the modern theory about the origin of solar system.	.....
17	Concave lens <u>converges</u> the light rays that falling on its surface.	.....
18	Sudden violent <u>chemical</u> reactions occur within the star which led to its explosion.	.....

19	Reproduction by sporogony occurs in <u>starfish</u>.	.....
20	The long-sightedness is corrected by using <u>concave mirror</u>.	.....
21	Amoeba reproduces by <u>budding</u>.	.....
22	The formed image of an object that is put at <u>the centre of curvature</u> for a convex lens is virtual enlarged.	.....
23	The spindle fibers are formed in the plant cell from the <u>centrosome</u>.	.....
24	Chromosomes are arranged at the middle of the cell in the <u>telophase</u>.	.....
25	Contact lenses can stick to eye <u>iris</u> and can be removed easily.	.....
26	<u>Acceleration</u> is the actual length of the path that a moving object takes from the starting point of movement to the end point.	.....
27	The clear vision for a normal vision person remains, if the object comes closer at a distance not less than <u>60</u> cm.	.....
28	A phase where some important biological processes occur to prepare the cell for division is called <u>prophase</u>.	.....
29	Velocity is the quantity that we can identify it accurately by knowing its <u>magnitude only</u>.	.....
30	If an object is put in front of concave mirror at <u>focus</u> , the formed image is real, inverted and equal to the object.	.....
31	<u>Crossing star</u> is a glowing gaseous sphere revolving around itself, from which the solar system was originated.	.....
32	<u>Average speed</u> is the speed of a moving object relative to a constant or a moving observer.	.....
33	The chromosome consists of two chromatids connected together at the <u>nucleus</u>	.....
34	The speed of a car can be identified directly by using the <u>compass</u>.	.....
35	In the universe , groups of <u>planets</u> are gathered to form the galaxies.	.....
36	When the light ray falls by an angle of <u>30°</u> on the reflecting surface, so the reflected ray will be perpendicular on the reflecting surface.	.....

37	The parent individual disappears during the reproduction by <u>sporogony</u>.	.....
38	The universe emerged from the particles of <u>oxygen and nitrogen</u>.	.....
39	The spindle fibers in the animal cell is formed from <u>condensing the cytoplasm</u>.	.....
40	The lens is a transparent medium that <u>reflects</u> the light.	.....
41	In plane mirror the object distance from the mirror is <u>larger than</u> the image distance.	.....
42	<u>Asexual</u> reproduction is a source of genetic variation.	.....
43	The Sun takes about <u>250</u> million years to complete one rotation around the center of the galaxy.	.....
44	If two cars moving in the same direction at the same speed equal 120 m/sec., so the relative speed equal <u>60 m/sec</u>.	.....
45	<u>The scientist Isaac Newton</u> published a research entitled "world order" and that was in 1796.	.....
46	<u>Mitotic cell division (mitosis)</u> aims to produce gametes.	.....
47	Yeast fungus reproduce asexually by <u>regeneration</u>.	.....
48	The lens is a transparent medium that <u>reflects</u> the light and defined with two spherical surfaces.	.....
49	Amoeba reproduces by <u>Budding</u>.	.....
50	The old stars are gather in the <u>edges</u> of the galaxy.	.....
51	The word ambulance is written on ambulance cars <u>minimized</u>.	.....
52	Number of chromosomes in an ovum cell containing <u>double</u> number of chromosomes in the one of liver cells.	.....
53	The <u>force</u> is the length of the shortest straight line between two position.	.....
54	It is a cell produced due to fertilization called <u>tetrad</u> .	.....

55	The lion is considered one of the fastest wild animals.	.....
56	The chromosome chemically consists of nuclear acid called DNA and starch.	.....
57	The irregular speed is the value of displacement at a unit time and is a vector quantity.	.....
58	The crossing star is the largest star that can be seen from the surface of the Earth.	.....
59	In the Big Bang theory explains that the universe is formed by the cohesion of Oxygen and Nitrogen particles.	.....
60	Chromosomes pairs arranged on the cell's equator in anaphase 1.	.....
61	the solar system is located in one of the circular arms of the Milky Way galaxy.	.....
62	When putting a body on a distance of 16 cm from a concave mirror its focal length is 12 cm, then the image formed will be virtual upright and magnified image.	.....
63	Displacement is described by magnitude and time.	.....
64	a boat starts to move from rest till its speed becomes 2.5 m./sec. through 5 sec. this means that it moves with acceleration 10 m/sec²	.....
65	The total distance covered by a moving body divided by the total time taken equals the non-uniform speed.	.....
66	The incident light ray is the light ray that bounces from the reflecting surface.	.....
67	A concave mirror of focal length 10 cm , so its radius of curvature equals 5 cm.	.....
68	The focus is a point inside the lens placed on the principal axis in the mid distance between its faces.	.....
69	When an object is placed at the centre of curvature of the mirror, the formed image is real , inverted and enlarged.	.....
70	The real image cannot be received on a screen.	.....
71	A spherical mirror whose diameter is 40 cm, so its focal length equals 40 cm.	.....
72	Eight planets including the Earth rotate around the galaxy.	.....

***(5) Give reason for:**

1. Displacement is a vector quantity.
.....
2. focal length of a concave mirror can be determined by knowing its radius of curvature.
.....
3. The continuous expansion of space.
.....
4. The image formed by the convex mirror can't be received on a screen.
.....
5. The formed image by the convex mirror is always virtual.
.....
6. Occurrence of interphase before starting the cell division .
.....
7. When the object is placed at the focus of a convex lens, the image is not formed.
.....
8. There are no new races of grapes , when they reproduce by vegetative reproduction.
.....
9. The nebula lost its sphere form and became in a form of a flat rotating disk.
.....
- 10.The body which moves at acceleration can't move at a regular speed.
.....
- 11.Shrinking of spindle fibers during the anaphase.
.....
12. (Distance - Time) graph of an object that moves at uniform speed is a straight line passing through the origin point.
.....
- 13.Asexual reproduction in living organisms produces individuals identical in genetic structure.
.....
- 14.Word ambulance is written in a converted (laterally inverted) way on the ambulance car.
.....

15.The short-sightedness is corrected by using a concave lens.

16.Cellular division begins with interphase before starting mitosis division.

17.The lens had two centers of curvature (C1 and C2).

18.Binary fission is considered a mitotic division.

19.The force is a vector quantity.

20.Uniform speed for a car hard to done practically.

21.Crossing over phenomenon is an important factor in genetic variation among individuals of the same species.

22.Meiotic division is called by reduction division.

23.Pilots take in consideration the velocity of the wind.

24.The image formed by a plane mirror cannot be received on the screen.

25.When you look at the mirror you see your face image.

26.Mitosis is important for children, unlike the meiosis.

27.The perpendicular incident light ray on plane mirror reflects on itself.

28.Cataract disease infects the eye.

29.Sexual reproduction is a source of genetic variation .

30. There are no new races (new individual with other trait) of plants, when they reproduce by vegetative reproduction.
.....
31. Occurrence of interphase before starting the mitosis cell division.
.....
32. The constancy of the planets in their orbits around the Sun.
.....
33. The concave lens is used to treat a short-sightedness person.
.....
34. The word "AMBULANCE" is written laterally inverted way on the ambulance car.
.....
35. The Sun escaped from the gravity of the huge star in the crossing star theory.
.....
36. The number of chromosomes is constant in the same species which reproduce sexually.
.....
37. In short-sightedness, the retina is far from the eye lens.
.....
38. The object which moves at regular speed, its acceleration equals zero.
.....
39. Distance is a scalar physical quantity.
.....
40. Speed of a moving body increases by decreasing time needed to cover a certain distance.
.....

***(6) What happen if:**

1. Absence of centrosome in the animal cell.
.....
2. A light ray is incident passing through the optical center of a convex lens.
.....
3. Less convexity of the eye lens surfaces.
.....
4. Approaching of a huge star to the Sun according to the crossing star theory.
.....
5. When an injured liver or cutting a part of it.
.....
6. To the displacement of a moving body when it returns back to its starting point.
.....
7. To the speed of a body if it covers the same distance in half the time.
.....
8. When rupturing sporangium in bread mould fungus.
.....
9. To the distance between the image and the plane mirror when the body becomes closer to the mirror.
.....
10. Reproductive cells are divided by meiosis.
.....
11. The initial speed of a moving body is greater than the final speed.
.....
12. The combination of the male gamete and female gamete.
.....
13. If the starfish loses one of its arms containing a part of its central disc .
.....
14. If the incident light ray falls parallel to the principal axis of concave mirror.
.....
15. Focusing laser on the gold Nano-particles in the cells infected by cancer.
.....

16. A light ray is incident passing through the center of curvature of a concave mirror.

.....

17. A light ray passes through the optical center of the lens.

.....

18. Putting a yeast fungus in a warm sugary solution.

.....

19. The nebula gradually lost its heat (from point of view of Laplace scientist).

.....

20. The liver gets injured or a part of it is cut.

.....

21. The parts of the inner chromatids are exchanged in the first prophase.

.....

22. An object is put at the focus of a convex lens.

.....

23. The starfish misses one of its arms and it contains a part of its central disk.

.....

24. The centrosome disappears from the animal cell.

.....

25. Reflection of a light ray falls on a concave mirror to pass with its focus.

.....

26. A body is placed at a distance less than the focal length of a concave mirror.

.....

27. The shortness of the diameter of the eyeball.

.....

***(7) Define each of the following :**

1. The scalar physical quantity.

.....

.....

2. The crossing over phenomenon.

.....

.....

3. The optical center of the lens.

.....

.....

4. The binary fission.

.....

.....

5. Contact lens.

.....

.....

6. Tetrad.

.....

.....

7. The focal length of a lens.

.....

.....

8. Zygote.

.....

.....

9. Fertilization.

.....

.....

10. Irregular speed.

.....

.....

11.The radius of curvature of a mirror.

.....

.....

12.Reproduction by sporogony (spore propagation).

.....

.....

13.Average speed.

.....

.....

14.Angle of incidence.

.....

.....

15.Regular (uniform) speed.

.....

.....

16.The pole of the mirror.

.....

.....

(8) Problems*1**

An object moves in a straight line northward at a speed of 5 m/sec. and its speed reaches 20 m/sec through 3 seconds.

Calculate the following:

1. The velocity after 3 seconds.
2. The acceleration of the moving object.

.....

.....

.....

2

Two race cars, the first car moves at a speed of 80 km/h, while the second car moves at a speed of 120 km/h, in the same direction. Mention the following :

1. The relative speed of the first car relative to an observer standing on one side of road.
2. The relative speed of the second car relative to passenger in the first car.

.....

.....

3

A car moved from rest and its speed became 25 m/s. during 10 seconds.

Calculate its acceleration.

.....

.....

.....

4

The opposite figure represents one of meiotic division (meiosis) phases :

- 1 . What is the name of this phase ?
2. Draw the phase next to this phase.



.....

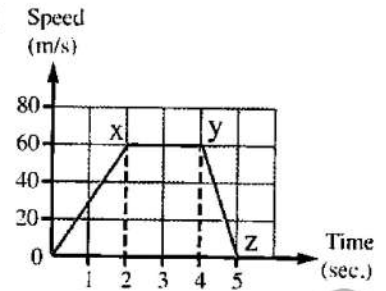
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.....

5

From the opposite graph which represents the motion of a car

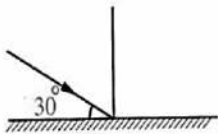
1. value of the maximum speed of the car equals m/s.
2. The kind of acceleration in part (yz) is



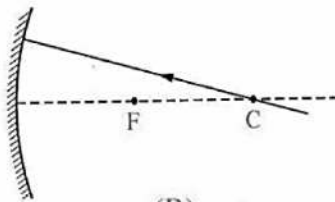
6

In the following two figures :

What is the value of the angle of reflection of the incident rays in figures (A) and (B)?



(A)

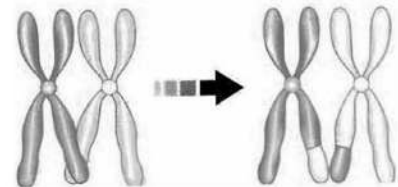


(B)

7

The opposite figure shows a vital phenomenon :

1. What is the name of this phenomenon?
2. Mention the name of the phase in which this phenomenon occurs and mention the type of its division.
3. What is the importance of its occurrence?



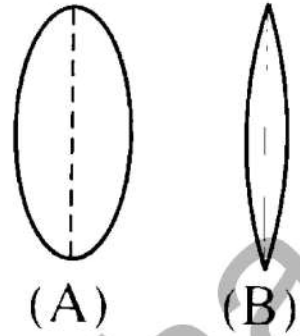
8

Write the assumptions of crossing star theory for the origin of the solar system
(4 assumptions only).

9

In the opposite figure, two eye lenses for two eyes equal in eye diameter for two different persons.

Which of them has short-sightedness and why ?



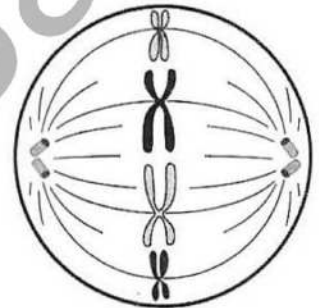
(A)

(B)

10

Through your study the stages of mitotic division answer the following :

1. Name the phase that preceding this phase the figure.
2. In which phase the centromere of each chromosome is split lengthwise into two halves ?
3. In which phase the spindle fibers disappear ?
4. What the importance of interphase?



11

Explain by drawing :

The formed image by convex lens, when the body at a distance greater than double the focal length. Then write the properties of the formed image.

12

Calculate the actual speed of the car whose relative speed is (80 km/h) relative to an observer moving in opposite direction at a speed of (30 km/h).

.....

.....

.....

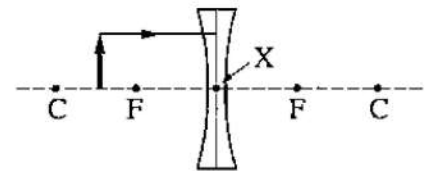
13

An object is placed at a distance of (8 cm) from a concave lens has a focal length (2 cm) :

1. Draw the direction of the ray that eye sees the image.
 2. Mention the properties of image formed.
-
-
-
-

14

1. Copy the figure then draw the rays that form the image of the object.
2. The point (X) refers to

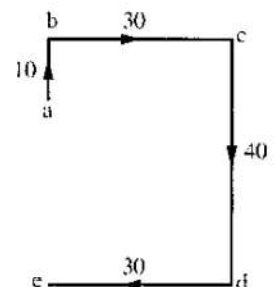


15

A person moves in the path (a b c d e) as shown in figure, he covered a distance of 10 m. northward in 2 seconds, then he covers 30 m. eastward in 10 seconds. and followed by 40 m. southward in 8 seconds, finally 30 m. westward in 5 sec.

1. Calculate the displacement of the person from the start of motion to end.
 2. In which part of the person motion, his speed was the least ?

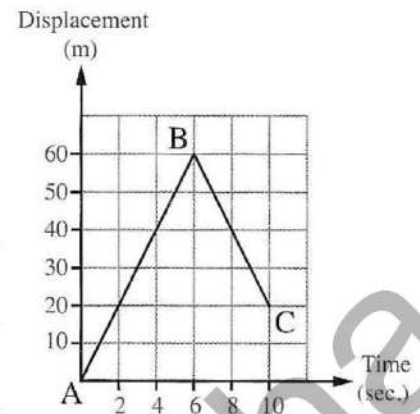
-
-
-



16

In the opposite figure , that represents the movement of an object from point (A) to point (C) passing by point (B), **Calculate the following :**

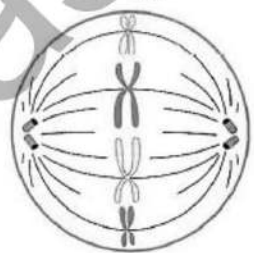
1. Speed.
2. Velocity.



17

The figure in front of you shows a phase of cell division. Answer the following :

1. What is the type of this division ?
2. What is the name of this phase ?
3. What is the importance of this type of division ?



18

A car moved from Banha to Cairo at a distance of 40 km in 30 minutes , then it returns back from Cairo to Banha in the same time. Calculate (in km/h) :

1. The car velocity from the beginning to the end of the journey.
2. The average speed of the car during the total time.

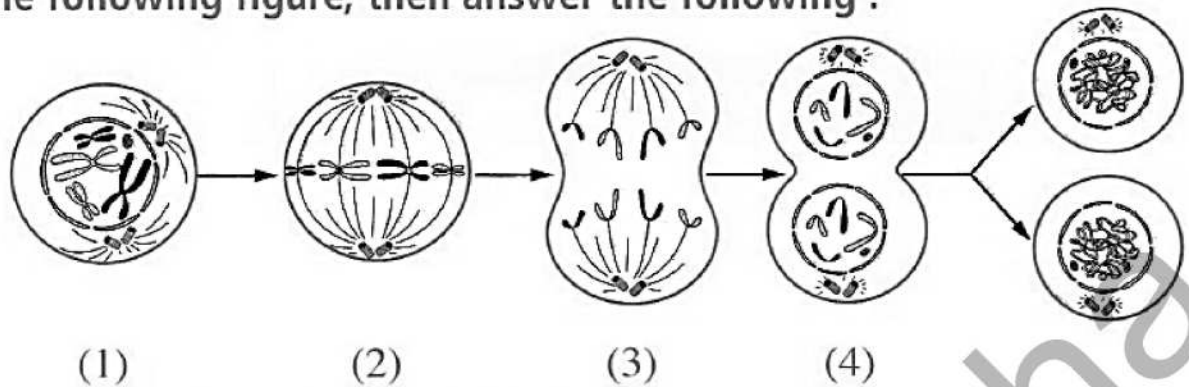
19

Mention the properties of the formed image in each of the following cases :

1. An object is placed in front of a convex mirror.
2. An object is placed in front of a convex lens at a distance less than its focal length .
3. An object placed at the focus of a convex lens.

20

Look at the following figure, then answer the following :



1. What is the kind of cell division in this figure ?
2. What is the name of phases number (2) and (3).
3. What will disappear in phase number (1).

.....

.....

.....

21

When each of the following values equal "Zero" :

1. Reflecting angle of a light ray incident on a plane mirror.
2. The velocity of a moving object.
3. Reflecting angle for an incident ray falls on reflecting surface of a concave mirror.

.....

.....

.....

22

An object is placed at a distance of 30 cm from a concave mirror with a radius of curvature 40 cm.

1. Calculate the focal length of the mirror.
2. Show by drawing the path of rays that show the formed image in this case.

.....

.....

.....

23

Two cells are divided, one of them in the plant stem and the other in the plant ovary, if you know the number of chromosomes in each of them is 6 pairs of chromosomes, mention:

1. The kind of cell division in each cell.
2. The number of chromosomes in each resulted cell.

.....

.....

24

In the opposite figure :

1. Complete the path of the rays to form an image for the object.
2. Mention the properties of the formed image.

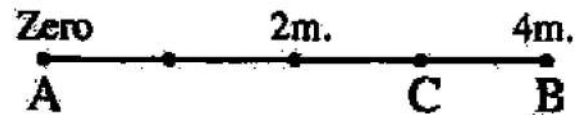
.....



25

A person moves from point (A) to point (B), then changes his direction to point (C) through 10 seconds, Calculate :

1. The total distance covered by the person.
2. The displacement done by the person.
3. The velocity.



.....

.....

26

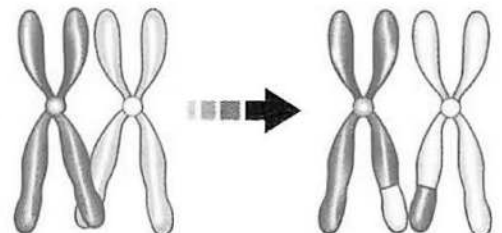
The opposite figure represents the crossing over phenomenon, Answer the following :

1. What happens in this phenomenon ?
2. What is the name of the phase in which this phenomenon occurs?
3. Draw the following phase to the phase in which this phenomenon occurs.

.....

.....

.....



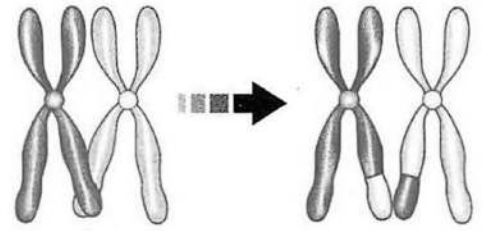
.....

33

27

The opposite figure :

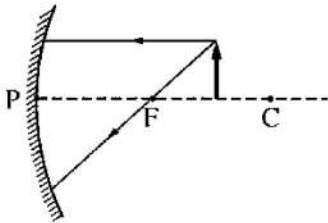
1. What is the name of this phenomenon in front of you ?
2. What is the importance of its occurrence.
3. Mention name of phase that this phenomenon occurs ?



28

Draw the figure in your answer paper, then :

1. Complete the path of the incident rays on the mirror from the object.
2. Mention the characteristics of the formed image and its position.



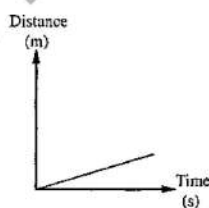
29

The opposite figure represents one of the division phases:

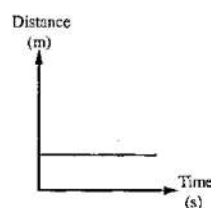
1. What is the name of this phase and the type of division ?
2. What is the name of next phase that follow it.



30

Describe the motion of the object in each of the following graph :

(1)



(2)

31

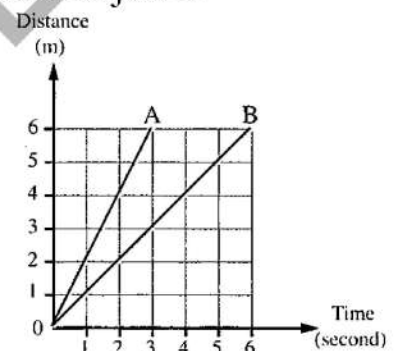
A racer covered 50 meters northward within 30 seconds then 100 meters eastward within 60 seconds then 50 meters southward within 10 seconds, and then returns back to the start point within 40 seconds :

1. Calculate the total distance that the racer moved ?
2. What is the average speed of the racer?
3. Calculate the displacement ?

32

The opposite graph represents the (distance - time) graph for the movement of two objects A , B From the graph, answer the following :

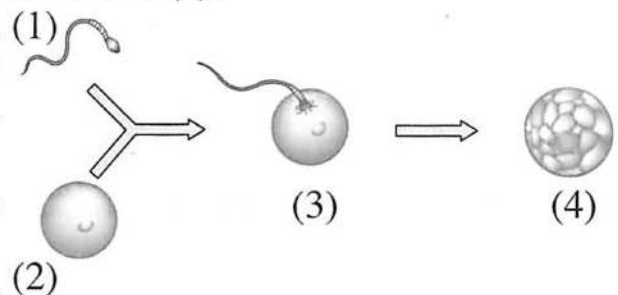
1. What is the kind of speed of the two objects ?
2. Calculate the ratio between the speed of object A and the speed of object B



33

The opposite figure represents one of the important process to complete the reproduction. Answer the following :

1. What is the name of the process that number (3) refers to and what is the name of the produced cell ?
2. What is the importance of forming the cell number (3) ?
3. What is the kind of division in part (4)?
4. What is the number of chromosomes in the cell number (1)?



34

An object is placed at a distance of 5 cm from a convex lens its focal length is 3 cm. Show by drawing the position of the formed image and mention the properties of this image, **by drawing two light rays only.**

.....

.....

.....

35

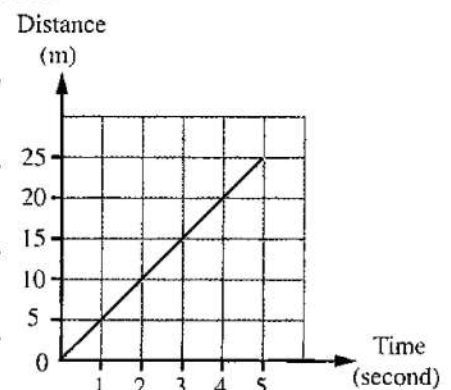
"A car starts movement from rest until its speed reaches 25 m/s after 10 seconds."

1. Calculate the value of acceleration.
 2. What kind is the acceleration ?
-
-
-

36

An object moves according to the graphical relation shown in the opposite figure, **calculate :**

1. The speed of the object's motion and mention its kind.
 2. The time that the object takes to cover a distance of 15 meters.
 3. The distance that the object covers in 4 seconds.
-
-
-
-
-



Model answer

★ (1) Write the scientific term:

1. Speed	13. Motion	25. Velocity	39. Pole of mirror	54. Nebula	69. Convex mirror
2. Fertilization	14. Optical center	26. Regeneration	40. Nucleus	55. Mitotic	70. Principal axis of lens
3. Universe	15. Universe	27. Centromere	41. Second law	56. Distance	71. Radius
4. Uniform speed	16. Light reflection	28. Secondary axis	42. Fertilization	57. Solar System	72. Focus
5. Concave lens	17. Solar system	29. Radius	43. Binary fission	58. Principal axis	73. Short-sightedness
6. Vegetative reproduction	18. Long-sightedness	30. Non-uniform speed	44. Interphase	59. Interphase	74. Nebula
7. Galaxy	19. Average speed	31. Relative speed	45. Big bang	60. Velocity	75. Sun
8. Angle of reflection	20. Uniform acceleration	32. Concave mirror	46. Tumor	61. Centromere	76. Laplace
9. Fertilization	21. Reproduction process	33. Optical center	47. Contact lens	62. Vegetative reproduction	77. Crossing star theory
10. Relative speed	22. Angle of incidence	34. DNA	48. Cataract	63. Modern theory	78. Light year
11. Gravity (attraction force)	23. DNA	35. Light reflection	49. Velocity	64. Relative speed	79. Universe
12. Reproductive cell	24. Convex mirror	36. Principal axis of mirror	50. Chromosome	65. Average speed	80. Big bang
		37. Nebula	51. Spindle fiber	66. Scalar quantity	81. Big bang
		38. Spherical mirror	52. Virtual image	67. Concave mirror	
			53. Crossing star theory	68. First law	

★ (2) Choose the right answer:

1. A	9. C	17. C	25. B	33. C	41. C	49. A	57. C	65. B
2. B	10. B	18. B	26. B	34. B	42. B	50. C	58. A	66. C
3. B	11. D	19. D	27. A	35. A	43. B	51. D	59. C	67. B
4. B	12. D	20. D	28. B	36. D	44. D	52. C	60. C	68. B
5. C	13. C	21. B	29. D	37. C	45. D	53. C	61. A	69. A
6. C	14. B	22. B	30. A	38. D	46. D	54. B	62. B	70. C
7. D	15. C	23. D	31. A	39. C	47. C	55. B	63. C	71. C
8. D	16. B	24. D	32. D	40. D	48. A	56. D	64. A	

★ (3) Complete the following :

1. Milky way	21. Inner chromatid	36. Concave	53. Opposite	73. Distance
2. Somatic	22. Testis - ovary	37. Budding - regeneration	54. Prophase I	74. Zero
3. Scalar - vector	23. Long-sightedness - convex	38. Fred Hoyle	55. Eight	75. Motion
4. Fred Hoyle	24. Distance - time	39. gold	56. Vector	76. Parallel
5. Speed	25. Universe - solar system	40. Concave	57. 40	77. Center of curvature - pole of mirror
6. Focus	26. Centrosome - cytoplasm	41. Protein	58. Convex - concave	78. Concave
7. Gaseous	27. Milky way	42. Centrosome - condensing of cytoplasm	59. Budding - binary fission	79. Long-sightedness
8. Convex	28. Virtual	43. Hydra	60. Real	80. Optical center
9. Mitosis	29. Prophase	44. Pole of mirror	61. Galaxy	81. Pole of mirror
10. Laplace	30. Motion	45. Velocity	62. m/s^2	82. Light reflection
11. Prophase	31. Medical glasses - plastic	46. $m/s - m/s^2$	63. budding	83. Chamberlain and moulton
12. Galaxy	32. Converge - diverge	47. Prophase I - first meiotic	64. Convex	84. 220 Million - milky way
13. Vector - scalar	33. Milky way - edge of galaxy	48. Concave - convex	65. Displacement	85. Galaxy
14. Spiral	34. Straight , curved	49. Milky way	66. Hubble	86. Hydrogen and helium
15. Mitotic - meiotic	35. Nucleus - chromosome	50. Asexual	67. Prophase	87. Laplace
16. Center		51. Contact lens	68. Radius	
17. Parallel to principal axis		52. Focus	69. Displacement	
18. Scalar			70. Vector - scalar	
19. Mass - force			71. Distance - time	
20. Spindle fiber			72. Straight	

★ (4) Correct the underlined words:

1. Eight	17. Diverge	31. Nebula	46. Meiotic cell division	61. Spiral
2. Centromere	18. Nuclear	32. Relative speed	47. Budding	62. Real - inverted
3. Itself	19. Mushroom	33. Centromere	48. Refract	63. Direction
4. Hydrogen	20. Convex lens	34. Speedometer	49. Binary fission	64. 0.5
5. Equal	21. Binary fission	35. Stars	50. Center	65. Average
6. Mushroom	22. Less than focus	36. Zero	51. Laterally inverted	66. Reflected ray
7. Reproductive cell	23. Condensing of cytoplasm	37. Binary fission	52. Half	67. 20
8. Virtual and erect	24. Metaphase	38. Hydrogen and helium	53. Displacement	68. Optical center
9. 220	25. Cornea	39. Centrosome	54. Zygote	69. Equal to object
10. 20	26. Distance	40. Refract	55. Cheetah	70. Virtual
11. Concave	27. 25	41. Equal	56. Protein	71. 10
12. 15000 million	28. Interphase	42. Sexual	57. Velocity	72. Sun
13. Protein	29. Magnitude and direction	43. 220	58. Sun	
14. 10	30. Center of curvature	44. zero	59. Hydrogen	
15. Prophase I		45. Laplace	60. Metaphase I	
16. Fred Hoyle				

★(5) Give reason for:

1. Because they have magnitude and direction
2. Because focal length (f) = $1/2 \times$ radius of curvature (r)
3. Due to the movement of galaxies apart
4. Because it is a virtual image.
5. Because it is formed behind the mirror from the intersection of the extensions of the reflected light rays and it can't be received on a screen.
6. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
7. Because the penetrating rays from a lens don't meet and pass through a parallel way at infinity.
8. Because vegetative reproduction depends on mitotic division, in which the produced cells contain a full copy of the genetic material of the parent cells.
9. because its revolving speed around itself increased.
10. Because its speed changes by passing time.
11. To form two identical groups of chromosomes at each pole of the cell.
12. Because the distance is directly proportional to the time when the object moves at a constant speed.
13. Because it occurs through one parental individual and through a mitotic division as the new individual gets a genetic copy identical to the parent.
14. Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.
15. Because the concave lens diverges the rays coming from a far object, so the image is formed on the retina
16. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
17. Because they have two circular surfaces, each surface has a center.
18. Because two identical cells are produced, each one is identical to the original cell.
19. Because they have magnitude and direction
20. Because its speed changes by passing time.
21. Because it contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them randomly in the gametes.
22. Because the produced cells contain half the number of chromosomes of the original cell.
23. Because the direction of the wind affects the velocity of the plane and hence the time of the trip and the amount of the fuel consumed.
24. Because it is a virtual image.
25. Due to light reflection.
26. Because mitosis division plays an important role in growth which the body of children needs, while meiosis division aims to the production of gametes in adults only.
27. Because the angle of incidence equals the angle of reflection equals zero.
28. Due to the following reasons : - Old age. - Illness. - Side effects of drugs. - Genetic readiness.
29. Due to the occurrence of the crossing over phenomenon during it.
30. Because vegetative reproduction depends on mitotic division, in which the produced cells contain a full copy of the genetic material of the parent cells.
31. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
32. Due to the Sun gravity.
33. Because concave lens diverges the rays coming from a far object, so the image is formed on the retina.
34. Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.
35. Due to the explosion in the expanded part of the Sun that faces the huge star.
36. Due to meiosis division (which reduce the number of chromosomes) in gametes, then the combination of male gamete (N) and female gamete (N) to form a zygote which contains the whole number (diploid number) of chromosomes ($2N$).
37. Due to the increase in the eyeball diameter.
38. Because its speed doesn't change by passing time ($\Delta V = \text{Zero}$).
39. Because they have magnitude only and have no direction
40. Because speed = d/t so, speed is inversely proportional to the time.

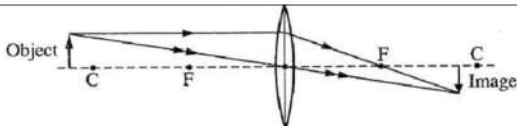
***(6) What happen if:**

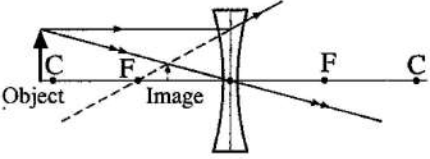
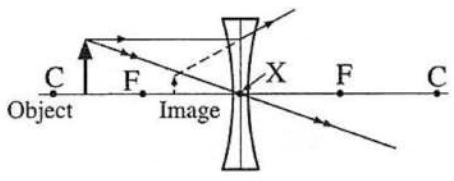
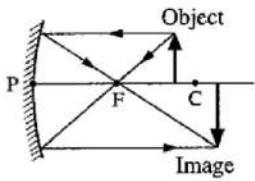
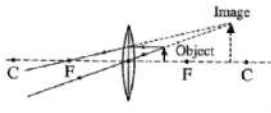
1. The spindle fibers are not formed therefore the cell division doesn't completed.
2. It passes through the lens without refraction.
3. This causes long-sightedness
4. The star attracted the Sun to it which led to a great expansion in the part of the Sun facing it.
5. The remaining cells undergo many mitotic divisions to compensate the missing part.
6. The displacement equal zero
7. It will increase to double
8. A large number of spores are released.
9. The image will move close to the mirror
10. They will produce the gametes that contain the half number of chromosomes.
11. The body speed decreases by passing time and the movement is described as a decelerating motion.
12. A zygote is produced which when it grows, it gives a new offspring with traits of its parents
13. This part grows forming a new individual
14. It reflects passing through the focus.
15. the nano-molecules of gold which stuck the surface of cancerous cell absorb the light of laser and convert it into heat which leads to burn and kill the infected cell.
16. It reflects on itself.
17. It passes through the lens without refraction.
18. The yeast fungus reproduces asexually by budding forming a new fungus separated from the parent cell or it remains connected to the parent cell forming a colony.
19. Its size contracted and its revolving speed around itself increased
20. The remaining cells undergo many mitotic divisions to compensate the missing part
21. Crossing over phenomenon occurs.
22. No image is formed.
23. The starfish compensates its lost arm and the arm forms new individual if it contains a part of the central disc.
24. The spindle fibers are not formed therefore the cell division doesn't completed.
25. It will reflection parallel to principle axis
26. A virtual , erect and magnified image is formed behind the mirror
27. This causes the shortness of the radius of the eye sphere, thus the retina is close to the eye lens and this causes long-sightedness

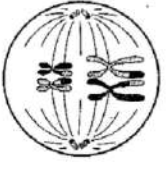
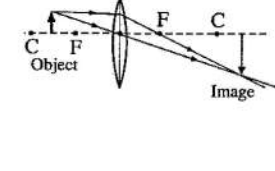
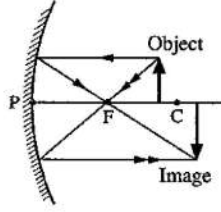
***(7) Define each of the following :**

1. It is the physical quantity that has magnitude only and has no direction.
2. It is a phenomenon that takes place at the end of prophase I and, in which some parts of the two inner chromatids of each tetrad are exchanged to produce new genetic arrangements.
3. It is a point inside the lens that lies on the principal axis in the mid distance between its faces.
4. It is a type of asexual reproduction where the nucleus divides mitotically, then the cell splits into two identical cells
5. They are very thin lenses made of plastic and can stick to the eye cornea by the eye fluid
6. They are the arrangement of homologous pairs of chromosomes where each pair consists of 4 chromatids.
7. It is the distance between the principal focus and optical center of the lens.
8. It is a cell produced due to fertilization and it contains the complete number of chromosomes of the living organism
9. It is the combination of a male gamete (N) and a female gamete (N) to form a zygote (2N).
10. It is the speed by which the object moves when it covers equal distances at unequal periods of time.
11. It is the radius of the sphere that the mirror is a part of it.
12. It is a type of asexual reproduction that occurs in some fungi and algae by producing spores.
13. It is the regular speed by which the object moves to cover the same distance at the same period of time.
14. It is the angle between the incident light ray and the normal.
15. It is the speed by which the object moves when it covers equal distances at equal periods of time (whether the distance and time are short).
16. It is the point that lies in the middle of the reflecting surface of the mirror.

*(8) Problems

1	1. The velocity after 3 sec is 20 m/s northward direction. 2. Acceleration (a) $= \frac{\text{Final speed (V}_2\text{)} - \text{Initial speed (V}_1\text{)}}{\text{Time at which change occurs } (\Delta t)}$ $a = \frac{20 - 5}{3} = \frac{15}{3} = 5 \text{ m/s}^2$	8	• Assumptions of the crossing star theory : It assumed that the origin of the solar system was the Sun. 1. Another huge star (crossing star) approached to the Sun. 2. This star attracted the Sun to it which led to a great expansion in the part of the Sun facing this star. 3. The expanded part from the Sun was exploded which led to : • The Sun escaped from the gravity of that star. • A gaseous line was formed of a great length from the Sun to the last planets. 4. The gaseous line started to condense due to the attraction force, then it cooled forming the planets.
2	1. The relative speed of the first car relative to an observer standing on one side of the race road = 80 km/h. 2. The relative speed of the second car relative to passenger in the first car = $120 - 80 = 40 \text{ km/h}$.		
3	$\text{Acceleration (a)} = \frac{\Delta V}{\Delta t} = \frac{V_2 - V_1}{\Delta t} = \frac{25 - 0}{10} = 2.5 \text{ m/s}^2$	9	– The person who has the eye lens (A) suffers from short-sightedness. – As the convexity of this lens face is large, so the focus nearer to the optical centre which lead to form a shorter focal length for the eye lens, so an unclear image is formed in front of the retina.
4	1. Metaphase I 2. Anaphase I  Anaphase I	10	1. prophase. 2. Anaphase. 3. Telophase. 4. The cell prepare itself for division.
5	1. 60 2. negative acceleration (Decelerating motion).		
6	(A) The angle of reflection = 60° (B) The angle of reflection = zero		
7	1. Crossing over phenomenon. 2. – This phenomenon occurs at the end of prophase I. – The type of the division is meiotic division. 3. Its importance : It works on the variation of genetic traits among the members of the same species, where it contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them randomly in the gametes.	11	 The properties of the formed image : – real, inverted and diminished.

12	Actual speed = relative speed – observer's speed. = 80 – 30 = 50 km/h	19	1. Virtual, erect and diminished image always formed. 2. Virtual, erect and magnified image is formed at the same side of the object. 3. No image is formed.
13	1.  2. The properties of the formed image : virtual, erect and diminished.	20	1. Mitotic division. 2. Metaphase – anaphase. 3. Nucleolus and nuclear membrane
14	1.  2. The optical centre	21	1. When the incident light ray falls perpendicular on the reflecting surface, Incident angle = Reflecting angle = zero. 2. When the moving object returns back to the same starting point, The displacement = zero, and so velocity = zero. 3. When the incident light ray falls passing through the centre of curvature of a concave mirror, Incident angle = Reflecting angle = zero
15	1. The displacement = 40 – 10 = 30 m. To the south. 2. $V_{(ab)} = \frac{10}{2} = 5 \text{ m/sec.}$ $V_{(bc)} = \frac{30}{10} = 3 \text{ m/sec.}$ $V_{(cd)} = \frac{40}{8} = 5 \text{ m/sec.}$ $V_{(de)} = \frac{30}{5} = 6 \text{ m/sec.}$ ∴ The person moves with the least possible speed in the part (bc).	22	1. Focal length = $\frac{r}{2} = \frac{40}{2} = 20 \text{ cm}$ 2. 
16	1. Distance = AB + BC = 60 + (60 – 20) = 100 m speed = $\frac{d}{t} = \frac{100}{10} = 10 \text{ m/sec.}$ 2. Velocity = $\frac{\text{displacement}}{\text{time}} = \frac{20}{10} = 2 \text{ m/sec.}$	23	1. In the plant stem cell: mitosis In the ovary cell : meiosis. 2. The resulted cell from mitosis : 6 pairs The resulted cell from meiosis : 3 pairs.
17	1. Mitosis. 2. Metaphase. 3. – The growth of living organism. – The compensation of the damaged cells.	24	1.  2. The properties of the formed image Virtual, upright and magnified.
18	1. Velocity = $\frac{\text{displacement}}{\text{time}} = \frac{\text{zero}}{1} = \text{zero}$ 2. Average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{80}{1} = 80 \text{ km/h.}$	25	1. The total distance = $\overline{AB} + \overline{BC} = 4 + 1 = 5 \text{ m}$ 2. Displacement = $\overline{AB} - \overline{BC} = 4 - 1 = 3 \text{ m}$ in the direction of east 3. The velocity = $\frac{\text{displacement}}{\text{time}} = \frac{3}{10} = 0.3 \text{ m/sec.}$ in the direction of east

26	1. Some parts of the two inner chromatids of each tetrad are exchanged to produce new genetic arrangement. 2. Prophase 1 (at its end). 3. The drawing of metaphase 1	 Metaphase I	34	The properties of the formed image : real, inverted and magnified.	
27	1. Crossing over phenomenon. 2. It works on the variation of the genetic traits among the members of the same species. 3. Prophase 1 (at its end).	35	1. $a = \frac{V_2 - V_1}{t} = \frac{25 - \text{zero}}{10} = 2.5 \text{ m/sec}^2$ 2. It is a positive acceleration.		
28	1.  2. The properties of the formed image, and its position : Real – inverted – magnified, at a distance greater than radius of curvature (double focal length).	36	1. $V = \frac{5}{1} = \frac{10}{2} = \frac{15}{3} = \frac{20}{4} = 5 \text{ m/sec.}$ It's kind is a regular speed. 2. 3 seconds 3. 20 meters		
29	1. Metaphase 1 – First meiotic division. 2. Anaphase 1.				
30	1. The object moving with uniform speed. 2. The object is at rest.				
31	1. Total distance = $50 + 100 + 50 + 100 = 300 \text{ m}$ 2. Average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{300}{140} = 2.14 \text{ m/sec}$ 3. Displacement = zero.				
32	1. Both objects move with a regular speed. 2. $V \text{ (of object A)} = \frac{4}{2} = \frac{2}{1} = 2 \text{ m/sec.}$ $V \text{ (of object B)} = \frac{4}{4} = \frac{2}{2} = 1 \text{ m/sec.}$ $V \text{ (A)} : V \text{ (B)} = 2 : 1$				
33	1. Fertilization – zygote. 2. The zygote contains the whole number of chromosomes which present in its species, and also its genetic trait comes from two sources (male gamete and female gamete). 3. Mitosis division. 4. (N).				

حمل الآن

مجانا وحصريا

المراجعة رقم (3)

الترم الاول



3rd prep Final Revision term (1)

1) Choose the correct answer:

- 1- The concept of motion of an object meansas time passes.**
a) stability of its position b) increasing its speed
c) changing its position d) decreasing its speed
- 2- If the speed of the moving car equals 90 Km/h, so its speed in m/s equals..**
a) 25 b) 50 c) 90 d) 324
- 3- When a moving object covers equal distances in equal periods of time, this means that the object moves at.....**
a) uniform speed. b) uniform acceleration.
c) average speed. d) relative speed.
- 4- A person traveled a distance of 300 meters east in 20 seconds, then returned to the starting point in 40 seconds. The average speed during the trip of going equals m/s.**
a) 5 b) 10 c) 15 d) 20
- 5- A racer moves in a circular path whose length is 30 m for 30 rounds in 3 minutes, so his average speed equals..... m/s.**
a) 5 b) 10 c) 15 d) 20
- 6- A car moved for two hours and its average speed was 40 km/h. If its speed in the first hour was 20 km/h, then its speed in the second hour was.....**
a) 20 km/h. b) 40 km/h. c) 60 km/h. d) 80 km/h.
- 7- A plane started its flight at eight in the morning, it was moving at a speed of 800 km/h, to cover a distance of 1600 km, so its arrival time will be at...**
a) three (pm). b) ten (am). c) one (am). d) ten (pm).
- 8- Car (A) moves with a speed of 70 km/h, and car (B) moves with a speed of 40 km/h in the same direction of car (A), so the speed of car (A) relative to an observer in car (B) equals km/h.**
a) 30 b) 40 c) 80 d) 120
- 9- The graphical relationship (..... - time) for movement of an object at uniform speed is represented by a straight line parallel to the time axis.**
a) distance b) displacement c) speed d) acceleration

- 10- The ratio between the displacement covered by a body to the time taken to cover this displacement equals the.....
- a) distance b) velocity c) speed d) acceleration
- 11- A body moved a distance of 20 m in a straight line in the same direction, so the amount of its displacement ism.
- a) 20 b) 40 c) 80 d) zero
- 12- From the scalar physical quantities.....
- a) velocity b) displacement c) focal length d) acceleration
- 13- A body moves on the circumference of a circle its radius = r and covers πr distance, so its displacement equals.....
- a) $2\pi r$ b) $2r$ c) 2π d) π
- 14- In a clock, if the length of the hand of seconds is 3 cm, so the time taken by the hand of seconds to cover a displacement of 6 cm equals
- a) 60 sec. b) 30 minute. c) half a minute. d) quarter hour.
- 15- If an object moves on the circumference of a circle with diameter equals 14 cm., so the number of cycles that the object moved to covers a distance of 66 m, equals..... cycles.
- a) 1.5 b) 44 c) 66 d) 150
- 16- The product of the velocity of a body x time =
- a) distance b) displacement c) speed d) acceleration
- 17- Light.....phenomenon is the bouncing off the light ray in the same medium when it meets a reflecting surface.
- a) separation b) refraction c) reflection d) absorption
- 18- A person stood in front of a plane mirror at distance of (5 meters), a virtual image was formed for him at position (A), and when he moved a distance of (2 meters) towards the mirror, a virtual image was formed for him at position (B), so the distance between positions (A) and (B) equals..
- a) 7m. b) 5m. c) 3m. d) 2m.
- 19- If the distance between an object and its image in a plane mirror equals 80 cm, so the distance of the object to the mirror surface iscm.
- a) 20 b) 40 c) 60 d) 80

- 20-** When the incident light ray on a plane mirror is perpendicular to the reflected light ray, so the angle of incidence equals
- a) zero b) 45° c) 90° d) 30°
- 21-** Virtual, equal and erect image is formed in
- a) concave lens. b) plane mirror. c) concave mirror. d) convex mirror.
- 22-** If the angle between the reflected light ray and the reflecting surface equals 140° , the angle of incidence =.....
- a) 40° b) 50° c) 90° d) 140°
- 23-** Romans used a huge to burn the sails of enemy ships using the sun's rays.
- a) convex mirror b) concave mirror c) plane mirror d) concave lens
- 24-** If you know that the focal length of a concave mirror is 6 cm, then the distance from the mirror in which an object is placed to form a virtual image is equal to cm.
- a) 3 b) 6 c) 12 d) 16
- 25-** A body of 5 cm length is placed at 6 cm from a convex lens with a focal length of 4 cm, so the length of the formed image is cm.
- a) 3 b) 4 c) 5 d) 6
- 26-** If the distance between the two center of curvature of a lens is 16 cm, so its focal length equals..... cm.
- a) 2 b) 4 c) 8 d) 16
- 27-** The real image is always
- a) upright. b) smaller. c) magnified. d) inverted.
- 28-** Equal image is formed for an object at a distance of 10 cm from a concave mirror whose diameter of curvature is.....cm.
- a) 5 b) 10 c) 15 d) 20
- 29-** A spherical mirror forms an inverted image its length 3 cm for an object its length 9 cm, when the object is placed 20 cm from it, so the probable focal length of the mirror iscm.
- a) 20 b) 15 c) 10 d) 7
- 30-** The optical piece which is used to correct long-sightedness.....
- a) concave lens. b) convex lens. c) concave mirror. d) convex mirror.

- 31-** A body of length 10 cm is placed in front of a concave mirror with a focal length of 50 cm, then an inverted magnified image is formed. So the possible distance between the object and the mirror iscm.
a) 40 b) 75 c) 100 d) 120
- 32-** You noticed that your father put the book away from his eyes during reading. This means that he suffers from
a) decreasing the convexity of eye lens. b) cataract disease.
c) increasing the convexity of eye lens.
d) increasing the diameter of the eyeball.
- 33-** The building units of the universe are.....
a) planets. b) stars. c) galaxies. d) moons.
- 34-** The scientist who established the modern theory about the evolution of the solar system is.....
a) Laplace. b) Chamberlain. c) Fred Hoyle. d) Moulton.
- 35-** According to Laplace theory the nebula lost its sphere form due to..... force.
a) centrifugal b) electrical c) magnetic d) nuclear
- 36-** Scientists believe that the universe emerged from a massive explosion and is in a state of.....
a) continuous contraction. b) contraction then expansion.
c) expansion then contraction. d) continuous expansion.
- 37-** The burning mass that remained in the center of the nebula formed.....
a) moon b) planets c) Earth d) Sun
- 38-** Milky Way galaxy took its disk shape After aboutmillion years.
a) 50 b) 500 c) 5000 d) 50000
- 39-** Galaxies began to form after million years after the Big Bang.
a) 3000 b) 5000 c) 10000 d) 15000
- 40-** The chromosome chemically consists of nucleic acid and protein.
a) HNO_3 b) H_2SO_4 c) DNA d) HCl
- 41-** Mitotic division happens in the cells of the.....
a) two testes. b) two ovaries. c) liver. d) anther.

- 42-** The cell which contains half the number of chromosomes resulted from the division of.....
- a) anther cell. b) skin cell. c) liver cell. d) stomach cell.
- 43-** If the chromosomal number in the somatic cell is $2N$, then its number in the reproductive cell is.....
- a) N b) $2N$ c) $3N$ d) $4N$
- 44-** If the number of chromosomes in a somatic cell is $2N$, then their number in the gamete resulting from the division of a reproductive cell is
- a) N b) $2N$ c) $3N$ d) $4N$
- 45-** The ratio between the number of chromosomes that present in a gamete which resulting from meiosis division to the number of chromosomes that present in a somatic cell of the living organism is.....
- a) 1:4 b) 1:3 c) 1:2 d) 2:1
- 46-** cells are not divided at all.
- a) Skin b) Nerve c) Liver d) Stomach
- 47-** Number of chromosomes are reduced to half in.....of meiosis division.
- a) metaphase I b) anaphase I c) telophase I d) anaphase II
- 48-** Meiotic division happens in the cells of the.....
- a) skin b) bones c) liver d) testes
- 49-** If the number of chromosomes in the zygote cell of a plant is 8 pairs, then the number of chromosomes in the pollen cell of this plant is.....
- a) 8 pairs b) 16 chromosomes
c) 8 chromosomes d) 4 chromosomes
- 50-** The number of divisions that a bacterial cell divides to produce 32 new individuals are..... divisions.
- a) 4 b) 5 c) 6 d) 7
- 51-** We can produce new plants which are exactly similar to the mother plant by using.....
- a) gamete formation. b) fertilization. c) budding. d) tissue culture.
- 52-** The source of genetic variation is the reproduction.
- a) budding b) vegetative c) sexual d) asexual

2) Complete the following statements:

- 1- The result of multiplying the speed of a moving object by time is equal to the.....**
- 2- If a train covers a distance of 200 km in 120 minutes, therefore its speed equalskm/h.**
- 3- We resort to the term average speed when the body moves at a/anspeed.**
- 4- If a car covered a distance of 40 km in two hours, then covered a distance of 60 km in 3 hours so its average speed equalskm/h.**
- 5- If a car moves at a speed of 75 Km/h in a certain direction and it seems to an observer at a speed 15 km/h , therefore the speed of the observer iskm/h and moving in thedirection of the car.**
- 6- When a body moves atspeed it covers equal distances at unequal periods of time.**
- 7- The length is aphysical quantity, while the force is aphysical quantity.**
- 8- Acceleration is aphysical quantity, which is measured inunit.**
- 9- Velocity and displacement of an object are similar inand different in**
- 10- When the object moves at a constant uniform speed, this means that it moves at acceleration equals**
- 11- The object which moves at negative uniform acceleration, its final speedits initial speed.**
- 12- When a moving body returns back to the starting point, the displacement will equal**
- 13- A person moves 70 m northward then returned 40 m southward, so his displacement is**
- 14- A person moves from a starting point 20 m west, then returns back on the same road 8 m east, so the difference between the distance and the displacement equalsm.**

- 15- Thelight ray is the light ray that bounces from the reflecting surface.
- 16- Mirrors aresurfaces for light and they are plane or
- 17- If the angle between the incident light ray and the reflected light ray is 60° , then the angle of incidence equals
- 18- The distance between the body and its image in a plane mirrorthe distance between the body and the mirror.
- 19- The ratio between the diameter of a spherical mirror and its focal length equals
- 20- The center of curvature is located in front of the reflecting surface ofmirror, while it is located behind the reflecting surface ofmirror.
- 21-mirror used by the dentist during the examination.
- 22- The convex lens light rays falling on it, while concave lenslight rays falling on it.
- 23- Thehas two centers of curvature because it has two spherical faces.
- 24- The lens whose diameter of curvature is 20 cm, has a focal length of.....cm.
- 25- The image formed by the concave lens is always,and
- 26-lens has real focus, whilelens has virtual focus.
- 27-lens is thin at its center and thicker at the tips.
- 28- The rays converge after passing through alens at a point called theof the lens.
- 29- Thelens is used to correct short-sightedness.
- 30- Thelens is used instead of the medical glasses.
- 31- Theis located in one of thearms of the Milky Way on the edge of the galaxy.
- 32- Astronomers used a unit calledto measure the distances between celestial bodies.

- 33- The covered distance by light through three light years equalskm.
- 34- The continuous separation between galaxies as a result of their regular movement is known asof the universe.
- 35- is the theory that explains the origin of the solar system by the scientists Chamberlain and Moulton.
- 36- Fred Hoyle based his theory about the evolution of the solar system on the astronomical phenomenon called phenomenon.
- 37-telescope was launched in April 1990 and rotates around the Earth at a height of 500 km.
- 38- In fertilization process, the male gamete fuses with the female gamete to form
- 39- Before starting mitosis division the cell passes throughto prepare the cell for division.
- 40- The genetic material condenses and appears in the form of long, thin and double strings in
- 41- The number of cells resulting from 3 successive divisions of a somatic cell equals cells.
- 42- A series of adverse changes take place during theof mitosis.
- 43- The spindle fibers are formed during the cell division in the and disappear in
- 44- The number of cell divisions required to produce 128 cells from one cell of liver cells is equal to cell divisions.
- 45- Duringin mitosis, the centromere of each chromosome is divided longitudinally, then the two chromatids are separated from each other and thecontract.
- 46- The centromeres don't divide during thestage of the first meiotic division.
- 47- tetrad consists of chromatids and centromeres.
- 48- The ratio between number of produced cells from 4 successive divisions of a liver cell of a rabbit to the number of produced cells from complete division of a reproductive cell of the rabbit equals

- 49-rays are used to destroy cells of cancer, while Nano-molecules ofmetal are used to detect cells of cancer by loading on
- 50-reproduction requires special reproductive organs and systems to occur, butreproduction doesn't.
- 51- The offspring resulted fromreproduction has traits different from the original organism.
- 52-reproduction takes place by only one parent without producing gametes.
- 53- Sponge reproduces by, while Paramecium reproduces by.....
- 54- The type of asexual reproduction in amoeba is, but yeast fungus reproduces asexually by
- *****

3) What is meant by:

- 1- A car covers a total distance of 100 Km in one hour.
➤
- 2- The value of displacement equals 10 meter.
➤
- 3- An object moving in a straight line covers a distance of 20 meters each one second.
➤
- 4- A car moving at uniform speed equals 40 km/h.
➤
- 5- Relative speed.
➤
- 6- Angle of reflection.
➤
- 7- The radius of curvature of a concave lens is 7 cm.
➤
- 8- The secondary axis in a concave mirror.
➤

9- The focal length of a concave mirror equals 4 cm.

➤

10- The distance between the optical center of a convex lens and its focus equals 5 cm.

➤

11- Cataract disease:

➤

12- Light year.

➤

13- Chromosomes.

➤

14- Interphase.

➤

15- Tetrad.

➤

16- Regeneration.

➤

4) Write the scientific term:

1- The regular speed by which an object moves to cover equal distances at the same periods of time.

2- The covered distance in a constant direction and it is a vector physical quantity.

3- The displacement covered by the object in one second.

4- The light ray that bounces off the reflecting surface.

5- The law which explains the relation between the angle of incidence and the angle of reflection.

6- A point inside the lens lies on the principal axis in the mid distance between its faces.

7- The line extended between two centers of curvature of a lens passing through the optical center of the lens.

8- The light piece used in solar oven.

- 9- A mirror always forms a diminished image for the object.**
- 10- The optical piece that is thick at the center and less thick at the tips.**
- 11- A vision defect results due to the increase of the eyeball diameter than the normal.**
- 12- A very thin lens made of plastic and can stick to the eye cornea by the eye fluid.**
- 13- The space which contains all the galaxies, stars, planets, moons, living organisms and everything.**
- 14- A big star that can be seen from the Earth.**
- 15- A force responsible for maintaining the planets of the solar system in their orbits.**
- 16- Theory assumed that the solar system was originally a star rather than the Sun.**
- 17- A glowing gaseous sphere revolving around itself according to Laplace theory.**
- 18- The part in the cell which is responsible for cellular division.**
- 19- The part which is responsible for pulling the chromosomes towards the two poles of the cell during anaphase of cell division.**
- 20- Phase in which the chromosomes are arranged at the cell equator during cell division.**
- 21- Phase where some processes occur upon which the formation of chromosomes that equal in numbers with the parental cell take place.**
- 22- The type of asexual reproduction at which the parental individual disappears.**
- 23- Asexual reproduction occurs by different parts of plants without the need for seeds.**
- 24- Special organ of reproduction in fungi and algae produce spores.**

5) Put ($\checkmark$) or (x):

- 1- The path of movement may be straight, curved or a combination of both. ()
- 2- A car covers a distance of 360 km within 3 hours, so its speed more than a bike moves by a speed equals 25 m/sec. ()
- 3- The speed of the moving object increases by increasing the time required to cover a certain distance. ()
- 4- When the observer is static, the relative speed of a moving object is equal to its real speed. ()
- 5- Measuring the relative speed of a moving object depends on the observer's state and the direction of its movement. ()
- 6- The speed units are equivalent to the acceleration units. ()
- 7- When the car speed increases, the movement is described as decelerating motion. ()
- 8- The graphical relation (distance – time) for uniform motion at a constant speed represented by a straight line parallel to the time axis. ()
- 9- The velocity is the speed in a specific direction. ()
- 10- When a body makes a complete revolution in a circular path of diameter equals 10 meters, so the displacement is 10 meters. ()
- 11- Pilots take in consideration the velocity of the wind. ()
- 12- The object that moves at a constant speed moves at uniform acceleration. ()
- 13- When the driver of a moving car uses the brakes to stop it after a period of time, its initial speed becomes equal to zero. ()
- 14- To determine the length, mass and time, we must know the magnitude and the measuring unit. ()
- 15- Light moves at a constant speed in the space. ()
- 16- Virtual image can be received on a screen. ()
- 17- Concave mirror is a mirror whose reflecting surface is the inner surface of a sphere. ()
- 18- The light ray passing through the center of curvature of the concave mirror is reflected parallel to the principal axis. ()

- 19- The lens is a transparent medium that reflects the light and it is limited with two spherical surfaces. ()
- 20- There is only one principal axis of a lens. ()
- 21- When an object is placed at the focus of a convex lens, upright image is formed. ()
- 22- The diameter of curvature of the thick lens face is less than the diameter of curvature of the thin one. ()
- 23- Vision defects occur because the eye lens is not always of normal convexity. ()
- 24- Increasing the convexity of the eye lens causes long-sightedness. ()
- 25- Contact lenses are put directly on eye pupil. ()
- 26- Stars gather into groups to form galaxies. ()
- 27- The Sun takes about 220 million years to complete one rotation around the center of the galaxy. ()
- 28- In the center of our galaxy a lot of new stars gather surrounded by small stars. ()
- 29- Saturn planet is the planet of life. ()
- 30- Primitive organisms (the earliest life) appeared on Earth after formation of the solar system. ()
- 31- Our galaxy has a distinctive shape according to the harmony and order of the groups of stars in it. ()
- 32- The distances in space measured in kilometer as the distance between stars are very large. ()
- 33- Fred Hoyle used the fact of explosion of stars to explain evolution of the universe. ()
- 34- The crossing star theory is more recent in time than the nebular assumptions. ()
- 35- The scientist Laplace was affected by the shape of the planet Mercury when formulating his theory. ()
- 36- The universe is the wide and extended space that contains galaxies. ()

- 37- According to the Big Bang theory, within minutes of the beginning of the universe, the ratio between helium and hydrogen gases was 3:1. ()
- 38- The Nebular theory considered the oldest assumptions that explained the origin of the solar system. ()
- 39- Scientists believe that the beginning of the universe was a gaseous small ball of high pressure and temperature. ()
- 40- Multicellular living organisms contain two types of cells. ()
- 41- The nucleic acid DNA carries the genetic information of the living organisms. ()
- 42- Spindle fibers appear during the cell division in the metaphase. ()
- 43- Meiosis differs from mitosis in that each cell contains half the number of chromosomes of the parent cell. ()
- 44- Gametes in living organisms are formed by the division of somatic cells. ()
- 45- The ratio between the number of chromosomes presents in a rabbit ear cell to the number of chromosomes present in an ovary cell is (2:1). ()
- 46- If the number of chromosomes in a liver cell of a certain living organism is 32 chromosomes, then the number of chromosomes in a reproductive cell is 16 pairs chromosomes. ()
- 47- The Egyptian scientist Mustafa El Said discovered a way to detect the cancer cells by using Nanotechnology. ()
- 48- Reproduction by sporogony is a form of sexual reproduction, which is more common in some fungi and some algae. ()
- 49- Sexual reproduction maintains the genetic structure of the living organisms. ()
- 50- The unicellular protozoans reproduce by binary fission. ()

6) Correct the underlined words:

- 1- The simplest type of motion is the motion in curved line.
- 2- If a body takes half the time to cover the double distance, so its speed equals quarter of its original speed.

- 3- The relative speed is the result of dividing the total distance covered by the total time.
- 4- The speed of the car can be identified directly by using the compass.
- 5- The average speed is the speed of a moving object relative to an observer.
- 6- The relative speed of a moving car relative to an observer at rest is less than the real speed.
- 7- The movement 25 m eastward is considered scalar physical quantity.
- 8- The magnitude of distance equals the shortest straight line between two positions.
- 9- Displacement is characterized by both magnitude and time.
- 10- If a body moves in a circular path for half a cycle, so the ratio between its displacement and its distance is equal to $\frac{22}{7}$
- 11- If the angle between the incident light ray and the reflected light ray on a plane mirror is 120° , the angle between the incident ray and the reflecting surface will be 60° .
- 12- The plane mirror is a mirror which its reflecting surface is a part of a hollow sphere.
- 13- The plane mirror is placed to the right and left sides of the car's driver.
- 14- The angle of incidence is larger than angle of reflection.
- 15- The focal length of a concave mirror is 5 cm, so its diameter of curvature is 10 cm.
- 16- If the radius of curvature of a concave mirror equals 30 cm, then its focal length is 60 cm.
- 17- When an object is placed at a distance equals 10 cm in front of concave mirror whose diameter equals 40 cm, a virtual and magnified image is formed.

- 18- The ratio between the length of the formed image to the length of the body in front of convex mirror is equal to one.
- 19- The properties of the formed images by the convex lens depend on the length of the object from the lens.
- 20- When an object placed at distance less than the focal length of a convex lens, the formed image is virtual, inverted and enlarged.
- 21- The Milky Way galaxy has an elliptical shape.
- 22- Hydrogen and nitrogen gases produced stars, galaxies and the universe over millions of years.
- 23- Scientists were able to trace the history of the origin of the universe from the first moments of its origin as a result of progress in biology and chemistry.
- 24- The solar system contains a lot of stars.
- 25- The nebular theory is attributed to Chamberlain.
- 26- The scientist Laplace publish research entitled (World order) about the origin of the universe.
- 27- The gaseous line in the crossing star theory forms the stars.
- 28- The Sun is the origin of the solar system according to modern theory.
- 29- The gametes contain diploid number of chromosomes.
- 30- The chromosome consists of two chromatids connected at the cytoplasm.
- 31- The nucleolus disappears during the mitotic cell division in telophase.
- 32- Gametes in living organisms are produced by the somatic cells during the meiotic division.
- 33- The sperm and the ovum share in the formation of zygote by a ratio 1:2 respectively.
- 34- Crossing over phenomenon happens in the end of the anaphase I.
- 35- In telophase II of meiotic division, two nuclei are formed, each contains half the original number of chromosomes in the mother cell.

- 36- The ratio between the number of the produced cells from two cellular divisions of a skin cell, and that produced from one cellular division of a testis cell equals 4:2.
- 37- Ovum is the cell that produced due to the fertilization process.
- 38- Vegetative reproduction is a form of sexual reproduction.
- 39- The offspring resulting from sexual reproduction get the genetic traits from one source.
- 40- Starfish arms could be regenerated and give a new animal if they contain a part of the bud.

7) Cross out the odd word and write the scientific term of others:

- 1- Time / Length / Force / Mass.
- 2- (m/sec) / (m.sec⁻¹) / (km/h) / (m.sec⁻²).
- 3- Force / Acceleration / Time / Displacement.
- 4- Virtual image / Upright image / Real image / Image equal in size to object.
- 5- Real image / Diminished image / Inverted image / Virtual image.
- 6- The eye / Telescope / Solar oven / Medical glass.
- 7- Big Bang theory / Nebular theory / Crossing star theory / Modern theory.
- 8- Nervous cells / Skin cells / Stomach cells / Muscles cells.
- 9- Sperm / Ovum / Fertilized ovum / Pollen grain.
- 10- Budding / Binary fission / Reproduction by seeds / Vegetative reproduction.

8) Mention the difference between (compare):

- 1- Scalar physical quantity and the vector physical quantity (in term of the definition).
- 2- Force and mass (according to the kind of physical quantity).
- 3- Virtual image and real image.
- 4- Convex lens and a concave lens in terms of (Definition - The type of the principal focus - The type of the images that is formed).
- 5- Long-sightedness and short-sightedness (in terms of reasons and the position of the formed image relative to the retina).

- 6- Laplace theory, The crossing star theory and Modern theory according to the origin of the solar system.
- 7- Centromere and centrosome.
- 8- Mitosis and meiosis (according to the type of cells in which the division takes place, importance and resulting cells).
- 9- The prophase of a cell in a plant stem, and the prophase of a cell in an animal skin.
- 10- Formation of gametes in human and flowering plants (according to the type of division and the organ in which it occurs).
- 11- Cancer and tumor (in term of the definition).
- 12- The yeast fungus and the hydra (according to the similarities and differences).
- 13- Starfish and Bread mold fungus (in terms of the condition for reproduction).

9) Give an example for:

- 1- Scalar physical quantity.
- 2- Vector physical quantity.
- 3- An optical piece used in the manufacture of the telescope.
- 4- An optical piece used in the right and left of the car driver.
- 5- Theory explaining the origin of the universe.
- 6- Theory explaining the origin of the solar system from the Sun.
- 7- Reproduction by binary fission.
- 8- Multicellular organism reproduces asexually by budding.
- 9- Unicellular organism reproduces asexually by budding.

10) Give reason for:

- 1- The motion of a train is an example of a motion in one direction.
➤
- 2- It is hard for a car to apply regular speed practically.
➤

- 3- The object speed increases by decreasing the time needed to cover a certain distance.
-
- 4- A car moving at a certain speed appears static to an observer moving by the same speed and in the same direction.
-
- 5- Physicists use mathematical methods like graphs and tables.
-
- 6- (Distance – Time) graph of an object that moves at a uniform speed is a straight line passing through the origin point.
-
- 7- The person who runs for minutes then walks for other minutes, moves with negative acceleration.
-
- 8- Displacement is a vector physical quantity.
-
- 9- When an object moves where its ending point is its starting point, then its velocity equals zero.
-
- 10- Speed and direction of the wind are important to pilots of the planes.
-
- 11- The body which moves at acceleration can't move at a regular speed.
-
- 12- The object which moves at a uniform speed, its acceleration equals zero.
-
- 13- The image formed by the plane mirror can't be received on a screen.
-
- 14- The word "Ambulance" is written in a laterally inverted way on the ambulance car.
-

15- Concave mirror is used to generate high heat energy.

(The concave mirror is called converging mirror.)

➤

16- Archimedes used a concave mirror to burn the sails of the Roman fleet.

➤

17- When an object is placed at a distance equals the focal length of a concave mirror, the image will be in the form of a light spot (no image is formed).

➤

18- A convex mirror is placed at the corners of narrow roads.

➤

19- A convex mirror is placed on railway and metro platforms.

➤

20- The lens has two foci, while the spherical mirror has one focus.

➤

21- The long-sightedness is corrected by using a convex lens.

➤

22- Our galaxy is called Milky Way galaxy.

➤

23- Sometimes a star glows in the sky for a short time to become the brightest star in the sky.

➤

24- The universe in a state of continuous expansion.

➤

25- The nebula lost its sphere form and became in a form of a flat rotating disk.

➤

26- Interphase precedes the cellular division.

➤

27- The cells of a plant stem need mitosis, while the plant anther needs meiosis.

➤

28- Shrinking of spindle fibers during the anaphase of mitosis.

➤

29- The changes that occur in telophase of mitotic division are called adverse changes.

➤

30- Meiotic division is called by reduction division.

➤

31- Asexual reproduction keeps the genetic structure of the living organism.

➤

32- There are no new races of grape when they reproduce by vegetative reproduction.

➤

33- Zygote contains the complete hereditary material.

➤

11) What happens when ... ? (What are the results of ... ?)

1- The time taken by a moving body increases to double to cover half the distance. (According to the speed)

➤

2- The object covers unequal distances at equal periods of time.

➤

3- The speed of an object changes by equal values through equal periods of time.

➤

4- A body moves with uniform speed. (According to the acceleration)

➤

5- The final speed of a moving body is greater than its initial speed.

➤

6- An object moves in a straight line in one direction.

(according to the speed and the velocity)

➤

7- A plane was traveling against the wind. (according to the plane's velocity, time taken for the flight and amount of fuel consumed)

➤

8- A light ray when incident on a concave mirror passing through its center of curvature.

(An incident light ray falls perpendicular on a reflecting surface of a plane mirror.)

➤

9- Placing a paper at the focus of convex lens that is directed at sunlight.

➤

10- The fall of a beam of light rays parallel to the principle axis on a concave lens.

➤

11- Light ray falls through the optical center of the lens.

➤

12- The body is placed at the focus of the concave mirror.

➤

13- The object is put at any distance from a convex mirror.

➤

14- The diameter of the eyeball is greater than normal.

➤

15- The radius of curvature of the surface of the eye lens increases than normal.

➤

16- The infection of the eye with the cataract disease.

➤

17- Galaxies move away from each other as time passes.

➤

18- The fusion of atomic particles after several minutes of the Big Bang.

➤

19- The nebula lost its temperature in Laplace's opinion.

➤

20- Explosion of the expanded part of the Sun faced the crossing star.
(according to Chamberlain and Moulton theory)

➤

21- The gaseous cloud is cooled. (in Fred Hoyle theory)

➤

22- Removing the nucleus of a somatic cell.

➤

23- The cell does not pass through the interphase before it enters its mitotic division.

➤

24- Absence of the centrosomes from an animal cell.

➤

25- The parts of the two inner chromatids of each tetrad are exchanged in the first prophase in meiotic division.

➤

26- An ovary cell divides meiotically.

➤

27- A person that infected with liver fibrosis disease and needs a liver doner.
(according to the doner person affected with any harm? And why?)

➤

28- Human skin gets injured or part of it is cut off.

➤

29- Putting a yeast fungus in a warm sugary solution.

➤

30- Starfish loses one of its arms, which contains a part of the central disc.
(for the starfish and for his lost arm)

➤

31- Sporangia of a bread mold fungus rupturing.

➤

32- Fusion of a sperm (male gamete) with an ovum (female gamete).

➤

12) What is the importance (use) of ... ?

- 1- Speedometer:
- 2- Concave mirror:
- 3- Convex mirror:
- 4- Contact lenses:
- 5- Light year:
- 6- Solar telescope:
- 7- Hubble telescope:
- 8- Centrosome in the animal cell:
- 9- Crossing over phenomenon:
- 10- Second meiosis division:
- 11- Reproduction process:
- 12- Vegetative reproduction:

13) Problems:

- 1- A ball is far from player (A) 50 m who runs with a speed of 3 m/s and far from player (B) 35 m who runs with a speed of 2 m/s, which player reaches the ball firstly (A) or (B)? (Showing the method of solution)
.....
.....
.....
- 2- A body moves in a straight line at a uniform speed and covered 150 meter in 10 second, then returns to the starting point in a time of 30 second. Calculate the average speed of this object during the return trip and the whole trip.
.....
.....
.....

- 3- A car moves on a straight road covering a distance of 90 km, where it covers $\frac{1}{3}$ distance with a speed of 25 km/h and the rest distance with a speed of 75 km/h, calculate the average speed by which the car moves.

.....
.....
.....

- 4- Two bodies A and B, each move at a constant speed as follows:

Body A moves according to the relation $d \text{ equals } = \frac{t}{2}$

Body B moves according to the relation $d \text{ equals } = 2 t$

Calculate the ratio between the speed of body B to the speed of body A, knowing that the time of the movement is constant.

.....
.....
.....

- 5- Calculate the relative speed of a car if its speed 80 km/h, relative to an observer moving in the same direction by speed 50 km/h.

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- 6- The relative speed of a car is 80 km/h, calculate the actual speed of the car when observer moves in the same direction of the car with a speed of 30 km/h.

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- 7- When the relative speed of a car equals three times the speed of an observer who moves at a speed equals 10 km/hr.

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8- When the relative speed of a moving object equals double (twice) the value of its actual speed.

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9- Two trains are moving on parallel tracks, in opposite directions. If the speed of the first train is 60 km/h, and the speed of the second train is 90 km/h, calculate the speed of the first train as it is observed by the passengers of the second train.

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10- A car moves at a speed of 30 m/sec., and when the driver uses the brakes, the car stops after 10 sec. Calculate the acceleration by which the car moves from the moment of using the brakes and mention the type of acceleration.

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11- A car moved at a regular speed of 20 m/s for 10 sec., then the driver applied the brakes, its speed decreased at a rate of 2 m/s^2 , calculate the car speed after 3 sec from using the brakes.

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12- An object moves by speed of 10 m/s, calculate the time required for its speed to become double, knowing that the object moves with an acceleration equals 2 m/s^2 .

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13- A car moved at a constant speed and covered a distance of 4800 meters in 2 minutes, then the driver pressed the brakes and its speed decreased at a rate of 2 m/s every 4 seconds, calculate the time required for the car to stop.

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14- A body moved with a constant acceleration for 11 seconds and its speed reached 3.6 km/h after five seconds. At the end of its movement, the speed reached 1.3 m/s. Calculate the speed of the body at which it starts to move.

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15- If a person stood on the top of a building its height equals 20 m, and he throws a ball up to height equals 10 m, then the ball falls down and stopped on Earth's surface below the building, find both the distance and the displacement covered by the ball.

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16- Calculate the displacement of an object when it makes half-circle and when it makes a complete circle on the circumference of a circle with a diameter of 7 km.

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17- Calculate the angle of incidence and also the angle between the incident light ray and the reflected ray, if the angle between the incident ray and the mirror surface equals 30° .

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.....

18- An object was placed in front of plane mirror and the distance between the object and its image was 5 meter. When the mirror moves a certain distance, the distance between the object and its new image becomes 4 meter. Determine the distance that the mirror moves, and its direction relative to the object.

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19- An object placed in the middle of the distance between two mirrors one of them is concave and the other is plane, the distance between them is 16 cm. an image equal to the object was formed in both cases. Detect the position of the body from the concave mirror and calculate its focal length.

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20- An object is placed at the mid distance between a plane mirror and the optical center of a convex lens its diameter of curvature equals 60 cm, an image for the object is formed by the plane mirror at a distance of 20 cm from it, show by drawing the properties of the formed image of the object by the convex lens.

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21- When an object is placed in front of a convex lens, no image appears on the screen. Detect the position of the body relative to the lens, draw the path of the rays and mention the properties of the formed image.

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22- Calculate the number of resulting cells and the number of chromosomes in each cell, if two successive mitotic divisions occur for a somatic cell contains 20 chromosomes.

.....

23- An ovary cell in a flower with a number of chromosomes ($2N$) divided by meiotic cell division. Calculate the total number of chromosomes of the resulting cells in telophase II.

➤

24- If all the arms of 50 individuals starfish were cut off and 35 of them their cut arms containing a part of the central disc, while the rest of the individuals their cut arms not containing a part of the central disc, what is the total number of the resulting complete organisms?

.....

14) Study the following figures then answer:

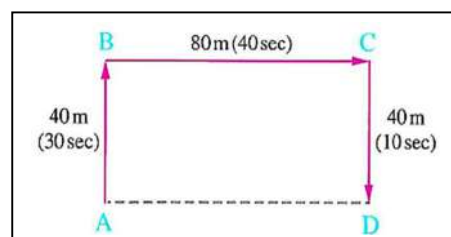
1- Study the opposite figure then calculate:

a) Displacement.

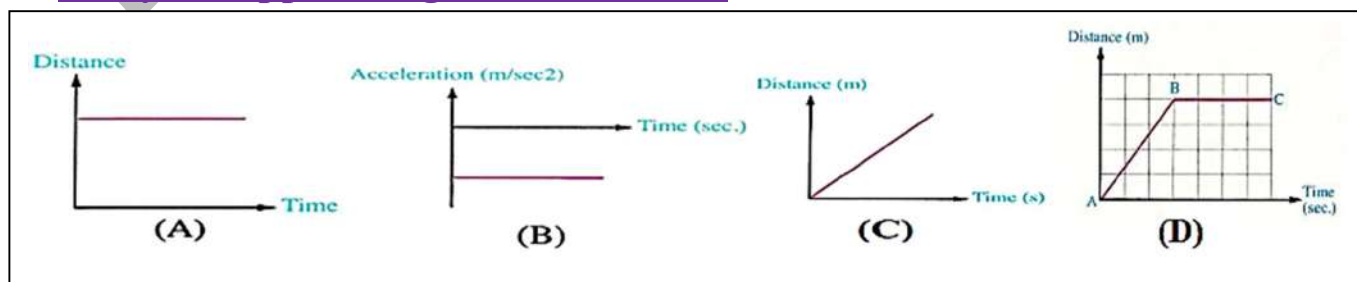
➤

b) Velocity.

➤



2- Study the opposite figure then answer:



a) Describe the motion of the object in:

• Figure (A).

➤

• Figure (B).

➤

• Figure (C).

➤

• Figure (D).

➤

b) What is the value of speed in figure (A)?

➤

c) In figure (D) the magnitude of the speed of the object in the interval (BC) is equal to the magnitude of in the interval (AB).
(distance – time – speed – acceleration)

d) What is the value of acceleration in figure (C)?

➤

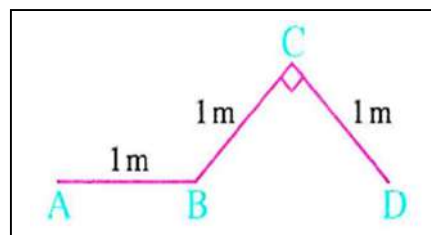
3- Study the opposite figure then calculate:

a) The distance covered by this object.

➤

b) The displacement of this object.

➤

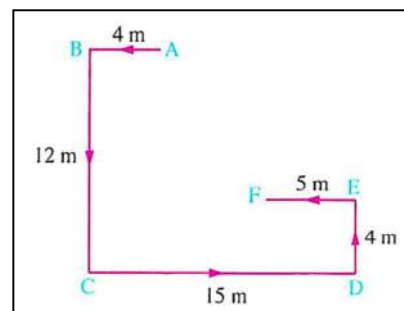


4- In the opposite figure:

An object moves from point A to point F passing by points B, C, D, and E in (8 sec.)
Calculate the average speed and average velocity.

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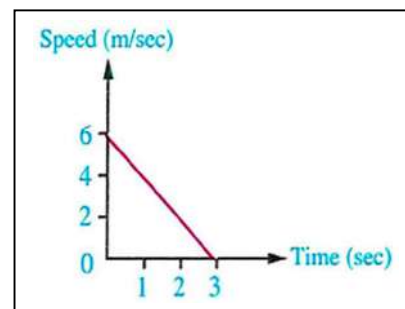
5- Study the opposite figure then calculate:

The acceleration by which the object moves.

.....

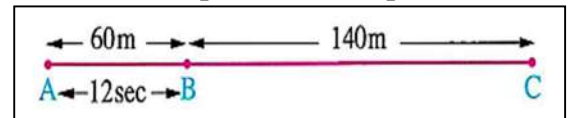
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6- In the opposite figure:

An object moves with uniform speed from point (A) to point (B) and it covers 60 m distance in 12 sec., then it moves with uniform acceleration from point (B) to point (C) according to the relation $[a = 20 + t]$ calculate:



a) The regular speed in the period AB.

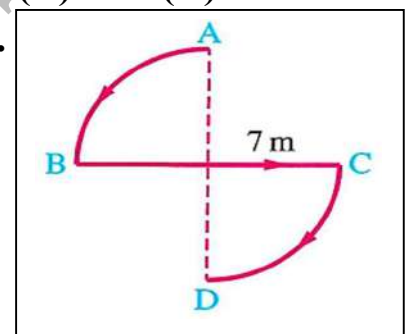
.....

b) The final speed in the period BC.

.....

7- In the opposite figure:

A car is moving in a circular path with a radius of 7m and circumference of 44 m from point (A) to point (D) through points (B) and (C) in 10 seconds. Calculate the average speed and velocity.



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8- The opposite graph represents the movement of two objects (X) and (Y):

a) Which of them starts its motion from rest?

➤

b) Which of them moves at a greater acceleration?

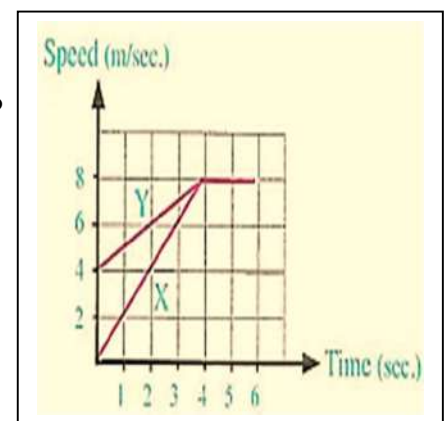
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c) When do the two objects start moving at a regular speed ? And what is its value ?

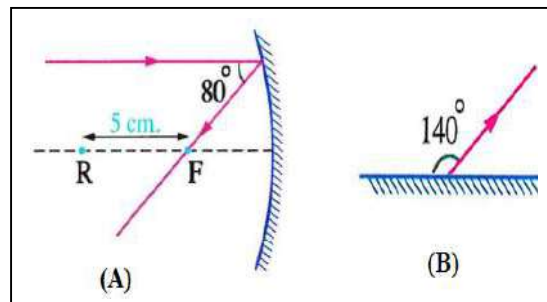
➤

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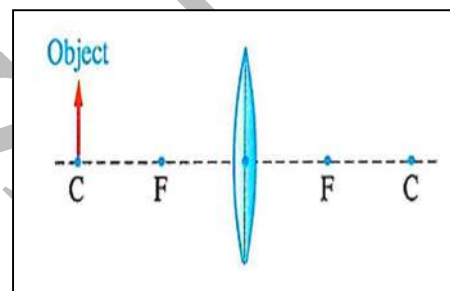
9- In the opposite figure complete:

- The type of mirror (A) is while that of mirror (B) is
- The incident angle in mirror (A) equals while the incident angle in mirror (B) equals
- The focal length of mirror (A) equalscm, while the diameter of curvature equalscm.



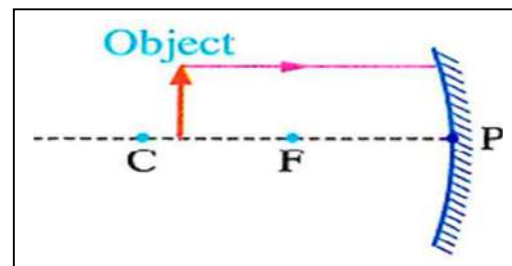
10- In the opposite figure:

- What is the type of lens?
 -
- Explain the path of the rays forming the image of the object.
- What are the properties of the formed image of the object?
 -



11- The figure represents image formation in a concave mirror.

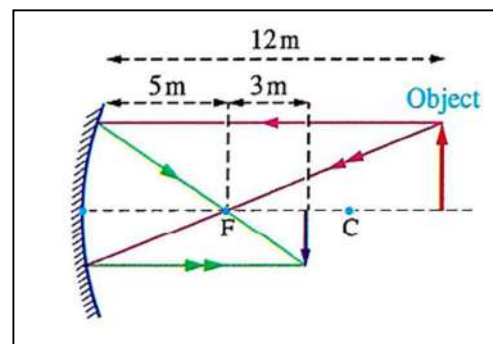
- Explain the path of the rays forming the image of the object.
- What are the properties of the formed image of the object?
 -



12- Study the opposite figure then calculate:

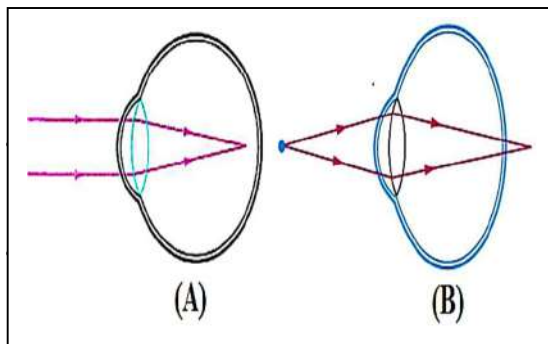
The distance that the object moves towards the mirror in order to form real, inverted and equal image.

-
-
-



13- Study the opposite figure then answer:

- The figure (A) represents a vision defect known as
- The figure (B) represents a vision defect known as
- Explain how does the defected eyes see the near and far objects in both defects.



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-

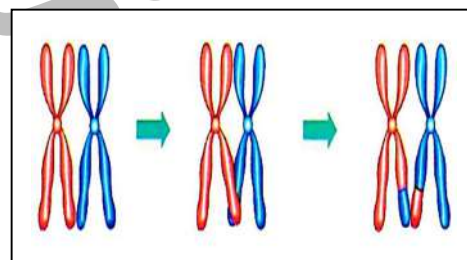
14- The figure represents one of the vital phenomena:

- What is the name of this phenomenon?

-

- How it works?

-
-
-



15- Study the opposite figure then answer:

- Mention the type of cell division in fig (A).

-

- Mention the name of the phase in fig (A).

-

- Mention the type of cell division in fig (B).

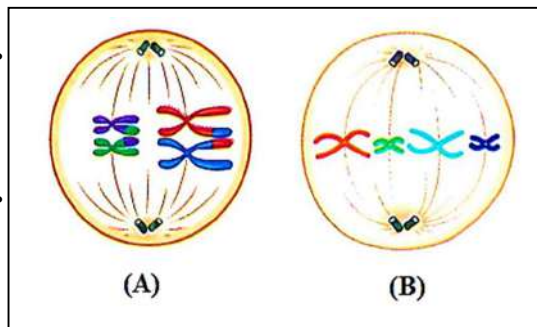
-

- What is the name of the phase that follows the phase in fig (B).

-

- What is the final result of the process in fig (B) after ending all phases?

-



16- Study the opposite figure then answer:

a) Mention the name of the phase.

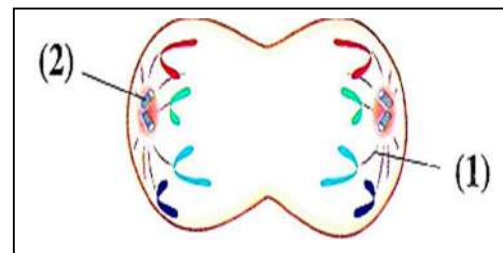
➤

b) What is the importance of structure (1)?

➤
.....

c) What is the importance of structure (2)?

➤



17- Study the opposite figure then answer:

a) Mention the name of the living organism.

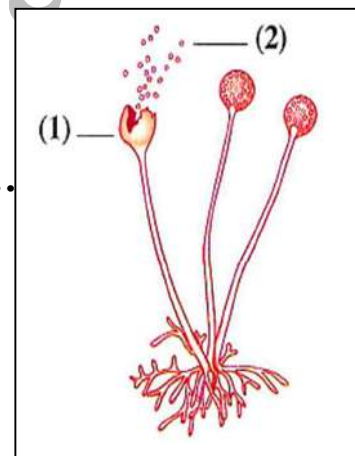
➤

b) What the numbers (1) and (2) indicate?

➤ (1) (2)

c) What is the method of its reproduction?

➤



3rd prep Final Revision (answered)

1) Choose the correct answer:

- 1-** The concept of motion of an object meansas time passes.
a) stability of its position b) increasing its speed
c) changing its position d) decreasing its speed
- 2-** If the speed of the moving car equals 90 Km/h, so its speed in m/s equals..
a) 25 b) 50 c) 90 d) 324
- 3-** When a moving object covers equal distances in equal periods of time,
this means that the object moves at.....
a) uniform speed. b) uniform acceleration.
c) average speed. d) relative speed.
- 4-** A person traveled a distance of 300 meters east in 20 seconds, then
returned to the starting point in 40 seconds. The average speed during the
trip of going equals m/s.
a) 5 b) 10 c) 15 d) 20
- 5-** A racer moves in a circular path whose length is 30 m for 30 rounds in 3
minutes, so his average speed equals..... m/s.
a) 5 b) 10 c) 15 d) 20
- 6-** Acar moved for two hours and its average speed was 40 km/h. If its speed
in the first hour was 20 km/h, then its speed in the second hour was.....
a) 20 km/h. b) 40 km/h. c) 60 km/h. d) 80 km/h.
- 7-** A plane started its flight at eight in the morning, it was moving at a speed
of 800 km/h, to cover a distance of 1600 km, so its arrival time will be at...
a) three (pm). b) ten (am). c) one (am). d) ten (pm).
- 8-** Car (A) moves with a speed of 70 km/h, and car (B) moves with a speed of
40 km/h in the same direction of car (A), so the speed of car (A) relative
to an observer in car (B) equals km/h.
a) 30 b) 40 c) 80 d) 120
- 9-** The graphical relationship (..... - time) for movement of an object at
uniform speed is represented by a straight line parallel to the time axis.
a) distance b) displacement c) speed d) acceleration

- 10- The ratio between the displacement covered by a body to the time taken to cover this displacement equals the.....
- a) distance b) velocity c) speed d) acceleration
- 11- A body moved a distance of 20 m in a straight line in the same direction, so the amount of its displacement ism.
- a) 20 b) 40 c) 80 d) zero
- 12- From the scalar physical quantities.....
- a) velocity b) displacement c) focal length d) acceleration
- 13- A body moves on the circumference of a circle its radius = r and covers πr distance, so its displacement equals.....
- a) $2\pi r$ b) $2r$ c) 2π d) π
- 14- In a clock, if the length of the hand of seconds is 3 cm, so the time taken by the hand of seconds to cover a displacement of 6 cm equals
- a) 60 sec. b) 30 minute. c) half a minute. d) quarter hour.
- 15- If an object moves on the circumference of a circle with diameter equals 14 cm., so the number of cycles that the object moved to covers a distance of 66 m, equals..... cycles.
- a) 1.5 b) 44 c) 66 d) 150
- 16- The product of the velocity of a body x time =
- a) distance b) displacement c) speed d) acceleration
- 17- Light.....phenomenon is the bouncing off the light ray in the same medium when it meets a reflecting surface.
- a) separation b) refraction c) reflection d) absorption
- 18- A person stood in front of a plane mirror at distance of (5 meters), a virtual image was formed for him at position (A), and when he moved a distance of (2 meters) towards the mirror, a virtual image was formed for him at position (B), so the distance between positions (A) and (B) equals..
- a) 7m. b) 5m. c) 3m. d) 2m.
- 19- If the distance between an object and its image in a plane mirror equals 80 cm, so the distance of the object to the mirror surface iscm.
- a) 20 b) 40 c) 60 d) 80

- 20- When the incident light ray on a plane mirror is perpendicular to the reflected light ray, so the angle of incidence equals
a) zero b) 45° c) 90° d) 30°
- 21- Virtual, equal and erect image is formed in
a) concave lens. b) plane mirror. c) concave mirror. d) convex mirror.
- 22- If the angle between the reflected light ray and the reflecting surface equals 140°, the angle of incidence =.....
a) 40° b) 50° c) 90° d) 140°
- 23- Romans used a huge to burn the sails of enemy ships using the sun's rays.
a) convex mirror b) concave mirror c) plane mirror d) concave lens
- 24- If you know that the focal length of a concave mirror is 6 cm, then the distance from the mirror in which an object is placed to form a virtual image is equal to cm.
a) 3 b) 6 c) 12 d) 16
- 25- A body of 5 cm length is placed at 6 cm from a convex lens with a focal length of 4 cm, so the length of the formed image is cm.
a) 3 b) 4 c) 5 d) 6
- 26- If the distance between the two center of curvature of a lens is 16 cm, so its focal length equals..... cm.
a) 2 b) 4 c) 8 d) 16
- 27- The real image is always
a) upright. b) smaller. c) magnified. d) inverted.
- 28- Equal image is formed for an object at a distance of 10 cm from a concave mirror whose diameter of curvature is.....cm.
a) 5 b) 10 c) 15 d) 20
- 29- A spherical mirror forms an inverted image its length 3 cm for an object its length 9 cm, when the object is placed 20 cm from it, so the probable focal length of the mirror iscm.
a) 20 b) 15 c) 10 d) 7
- 30- The optical piece which is used to correct long-sightedness.....
a) concave lens. b) convex lens. c) concave mirror. d) convex mirror.

- 31- A body of length 10 cm is placed in front of a concave mirror with a focal length of 50 cm, then an inverted magnified image is formed. So the possible distance between the object and the mirror iscm.
a) 40 b) 75 c) 100 d) 120
- 32- You noticed that your father put the book away from his eyes during reading. This means that he suffers from
a) decreasing the convexity of eye lens. b) cataract disease.
c) increasing the convexity of eye lens.
d) increasing the diameter of the eyeball.
- 33- The building units of the universe are.....
a) planets. b) stars. c) galaxies. d) moons.
- 34- The scientist who established the modern theory about the evolution of the solar system is.....
a) Laplace. b) Chamberlain. c) Fred Hoyle. d) Moulton.
- 35- According to Laplace theory the nebula lost its sphere form due to..... force.
a) centrifugal b) electrical c) magnetic d) nuclear
- 36- Scientists believe that the universe emerged from a massive explosion and is in a state of.....
a) continuous contraction. b) contraction then expansion.
c) expansion then contraction. d) continuous expansion.
- 37- The burning mass that remained in the center of the nebula formed.....
a) moon b) planets c) Earth d) Sun
- 38- Milky Way galaxy took its disk shape After aboutmillion years.
a) 50 b) 500 c) 5000 d) 50000
- 39- Galaxies began to form after million years after the Big Bang.
a) 3000 b) 5000 c) 10000 d) 15000
- 40- The chromosome chemically consists of nucleic acid and protein.
a) HNO_3 b) H_2SO_4 c) DNA d) HCl
- 41- Mitotic division happens in the cells of the.....
a) two testes. b) two ovaries. c) liver. d) anther.

- 42- The cell which contains half the number of chromosomes resulted from the division of.....
- a) anther cell. b) skin cell. c) liver cell. d) stomach cell.
- 43- If the chromosomal number in the somatic cell is $2N$, then its number in the reproductive cell is.....
- a) N b) $2N$ c) $3N$ d) $4N$
- 44- If the number of chromosomes in a somatic cell is $2N$, then their number in the gamete resulting from the division of a reproductive cell is
- a) N b) $2N$ c) $3N$ d) $4N$
- 45- The ratio between the number of chromosomes that present in a gamete which resulting from meiosis division to the number of chromosomes that present in a somatic cell of the living organism is.....
- a) 1:4 b) 1:3 c) 1:2 d) 2:1
- 46- cells are not divided at all.
- a) Skin b) Nerve c) Liver d) Stomach
- 47- Number of chromosomes are reduced to half in.....of meiosis division.
- a) metaphase I b) anaphase I c) telophase I d) anaphase II
- 48- Meiotic division happens in the cells of the.....
- a) skin b) bones c) liver d) testes
- 49- If the number of chromosomes in the zygote cell of a plant is 8 pairs, then the number of chromosomes in the pollen cell of this plant is.....
- a) 8 pairs b) 16 chromosomes
c) 8 chromosomes d) 4 chromosomes
- 50- The number of divisions that a bacterial cell divides to produce 32 new individuals are..... divisions.
- a) 4 b) 5 c) 6 d) 7
- 51- We can produce new plants which are exactly similar to the mother plant by using.....
- a) gamete formation. b) fertilization. c) budding. d) tissue culture.
- 52- The source of genetic variation is the reproduction.
- a) budding b) vegetative c) sexual d) asexual

2) Complete the following statements:

- 1- The result of multiplying the speed of a moving object by time is equal to the distance.
- 2- If a train covers a distance of 200 km in 120 minutes, therefor its speed equals 100 km/h.
- 3- We resort to the term average speed when the body moves at a/an irregular (non-uniform) speed.
- 4- If a car covered a distance of 40 km in two hours, then covered a distance of 60 km in 3 hours so its average speed equals 20 km/h.
- 5- If a car moves at a speed of 75 Km/h in a certain direction and it seems to an observer at a speed 15 km/h , therefor the speed of the observer is 60 km/h and moving in the same direction of the car.
- 6- When a body moves at irregular speed it covers equal distances at unequal periods of time.
- 7- The length is a scalar physical quantity, while the force is a vector physical quantity.
- 8- Acceleration is a vector physical quantity, which is measured in m/sec² unit.
- 9- Velocity and displacement of an object are similar in direction and different in magnitude.
- 10- When the object moves at a constant uniform speed, this means that it moves at acceleration equals zero.
- 11- The object which moves at negative uniform acceleration, its final speed less than its initial speed.
- 12- When a moving body returns back to the starting point, the displacement will equal zero.
- 13- A person moves 70 m northward then returned 40 m southward, so his displacement is 30 m northward.
- 14- A person moves from a starting point 20 m west, then returns back on the same road 8 m east, so the difference between the distance and the displacement equals 16 m.

- 15- The reflected light ray is the light ray that bounces from the reflecting surface.
- 16- Mirrors are reflecting surfaces for light and they are plane or spherical.
- 17- If the angle between the incident light ray and the reflected light ray is 60° , then the angle of incidence equals 30° .
- 18- The distance between the body and its image in a plane mirror doubles (twice) the distance between the body and the mirror.
- 19- The ratio between the diameter of a spherical mirror and its focal length equals 4:1.
- 20- The center of curvature is located in front of the reflecting surface of concave mirror, while it is located behind the reflecting surface of convex mirror.
- 21- Concave mirror used by the dentist during the examination.
- 22- The convex lens converges (collects) light rays falling on it, while concave lens diverges light rays falling on it.
- 23- The lens has two centers of curvature because it has two spherical faces.
- 24- The lens whose diameter of curvature is 20 cm, has a focal length of 5 cm.
- 25- The image formed by the concave lens is always virtual, upright and diminished.
- 26- Convex lens has real focus, while concave lens has virtual focus.
- 27- Concave lens is thin at its center and thicker at the tips.
- 28- The rays converge after passing through a convex lens at a point called the focus of the lens.
- 29- The concave lens is used to correct short-sightedness.
- 30- The contact lens is used instead of the medical glasses.
- 31- The solar system is located in one of the spiral arms of the Milky Way on the edge of the galaxy.
- 32- Astronomers used a unit called light year to measure the distances between celestial bodies.
- 33- The covered distance by light through three light years equals 28.38×10^{12} km ($3 \times 9.46 \times 10^{12}$).

- 34- The continuous separation between galaxies as a result of their regular movement is known as expansion of the universe.
- 35- Crossing star theory is the theory that explains the origin of the solar system by the scientists Chamberlain and Moulton.
- 36- Fred Hoyle based his theory about the evolution of the solar system on the astronomical phenomenon called stars explosion phenomenon.
- 37- Hubble telescope was launched in April 1990 and rotates around the Earth at a height of 500 km.
- 38- In fertilization process, the male gamete fuses with the female gamete to form zygote.
- 39- Before starting mitosis division the cell passes through interphase to prepare the cell for division.
- 40- The genetic material condenses and appears in the form of long, thin and double strings in prophase.
- 41- The number of cells resulting from 3 successive divisions of a somatic cell equals 8 cells.
- 42- A series of adverse changes take place during the telophase of mitosis.
- 43- The spindle fibers are formed during the cell division in the prophase and disappear in telophase.
- 44- The number of cell divisions required to produce 128 cells from one cell of liver cells is equal to 7 cell divisions.
- 45- During anaphase in mitosis, the centromere of each chromosome is divided longitudinally, then the two chromatids are separated from each other and the spindle fibers contract.
- 46- The centromeres don't divide during the anaphase stage of the first meiotic division.
- 47- tetrad consists of 4 chromatids and 2 centromeres.
- 48- The ratio between number of produced cells from 4 successive divisions of a liver cell of a rabbit to the number of produced cells from complete division of a reproductive cell of the rabbit equals 4 : 1.
- 49- Laser rays are used to destroy cells of cancer, while Nano-molecules of gold metal are used to detect cells of cancer by loading on proteins.

- 50- Sexual reproduction requires special reproductive organs and systems to occur, but asexual reproduction doesn't.
- 51- The offspring resulted from sexual reproduction has traits different from the original organism.
- 52- Asexual reproduction takes place by only one parent without producing gametes.
- 53- Sponge reproduces by budding, while Paramecium reproduces by binary fission.
- 54- The type of asexual reproduction in amoeba is binary fission, but yeast fungus reproduces asexually by budding.

3) What is meant by:

- 1- A car covers a total distance of 100 Km in one hour.
 - This means that the average speed of the car equals 100 km/h.
- 2- The value of displacement equals 10 meter.
 - This means that the distance covered at a certain direction from the primary position of movement towards its final position equals 10 meter.
- 3- An object moving in a straight line covers a distance of 20 meters each one second.
 - This means that it moving with a regular speed equals 20 m/sec.
- 4- A car moving at uniform speed equals 40 km/h.
 - This means that the car covers a distance of 40 km each one hour.
- 5- Relative speed.
 - It is the speed of a moving object relative to a static or a moving observer.
- 6- Angle of reflection.
 - The angle between the reflected light ray and the line perpendicular on the reflecting surface from the point of incidence.
- 7- The radius of curvature of a concave lens is 7 cm.
 - This means that half the diameter of the sphere where this lens is a part of it equals 7 cm.

8- The secondary axis in a concave mirror.

- It is any straight line that passes by the center of curvature of the mirror and any point on its reflecting surface except the pole of the mirror.

9- The focal length of a concave mirror equals 4 cm.

- This means that the distance between the focus of the concave mirror (F) and its pole (P) equals 4cm.

10- The distance between the optical center of a convex lens and its focus equals 5 cm.

- This means that the focal length of the lens equals 5 cm.

11- Cataract disease:

- It is a disease that causes a difficulty of vision due to the darkness of the eye lens.

12- Light year.

- The distance covered with light in one year and equals 9.46×10^{12} km.

13- Chromosomes.

- They are thread like bodies present in cell's nuclei and they represent the genetic material of the living organism.

14- Interphase.

- A phase precedes the cell division, in which some important vital processes occur to prepare the cell for division and the genetic material in the cell is doubled.

15- Tetrad.

- The arrangement of homologous pairs of chromosomes where each pair consists of 4 chromatids.

16- Regeneration.

- It is the ability of animals to compensate their missing parts.

4) Write the scientific term:

- 1- The regular speed by which an object moves to cover equal distances at the same periods of time. (Average speed)**
- 2- The covered distance in a constant direction and it is a vector physical quantity. (Displacement)**
- 3- The displacement covered by the object in one second. (Average velocity)**
- 4- The light ray that bounces off the reflecting surface. (Reflected light ray)**
- 5- The law which explains the relation between the angle of incidence and the angle of reflection. (The first law of light reflection)**
- 6- A point inside the lens lies on the principal axis in the mid distance between its faces. (The optical center)**
- 7- The line extended between two centers of curvature of a lens passing through the optical center of the lens. (Principal axis)**
- 8- The light piece used in solar oven. (Concave mirror)**
- 9- A mirror always forms a diminished image for the object. (Convex mirror)**
- 10- The optical piece that is thick at the center and less thick at the tips. (Convex lens)**
- 11- A vision defect results due to the increase of the eyeball diameter than the normal. (Short-sightedness)**
- 12- A very thin lens made of plastic and can stick to the eye cornea by the eye fluid. (Contact lenses)**
- 13- The space which contains all the galaxies, stars, planets, moons, living organisms and everything. (Universe)**
- 14- A big star that can be seen from the Earth. (Sun)**
- 15- A force responsible for maintaining the planets of the solar system in their orbits. (Gravity)**
- 16- Theory assumed that the solar system was originally a star rather than the Sun. (Modern theory)**
- 17- A glowing gaseous sphere revolving around itself according to Laplace theory. (The nebula)**
- 18- The part in the cell which is responsible for cellular division. (Nucleus)**

- 19- The part which is responsible for pulling the chromosomes towards the two poles of the cell during anaphase of cell division. (Spindle fibers)
- 20- Phase in which the chromosomes are arranged at the cell equator during cell division. (Metaphase)
- 21- Phase where some processes occur upon which the formation of chromosomes that equal in numbers with the parental cell take place. (Telophase)
- 22- The type of asexual reproduction at which the parental individual disappears. (Reproduction by binary fission)
- 23- Asexual reproduction occurs by different parts of plants without the need for seeds. (Vegetative reproduction)
- 24- Special organ of reproduction in fungi and algae produce spores. (Sporangium)

5) Put ($\checkmark$) or (x):

- 1- The path of movement may be straight, curved or a combination of both. ($\checkmark$)
- 2- Acar covers a distance of 360 km within 3 hours, so its speed more than a bike moves by a speed equals 25 m/sec. ($\checkmark$)
- 3- The speed of the moving object increases by increasing the time required to cover a certain distance. (x)
- 4- When the observer is static, the relative speed of a moving object is equal to its real speed. ($\checkmark$)
- 5- Measuring the relative speed of a moving object depends on the observer's state and the direction of its movement. ($\checkmark$)
- 6- The speed units are equivalent to the acceleration units. (x)
- 7- When the car speed increases, the movement is described as decelerating motion. (x)
- 8- The graphical relation (distance – time) for uniform motion at a constant speed represented by a straight line parallel to the time axis. (x)
- 9- The velocity is the speed in a specific direction. ($\checkmark$)

- 10- When a body makes a complete revolution in a circular path of diameter equals 10 meters, so the displacement is 10 meters. (x)
- 11- Pilots take in consideration the velocity of the wind. (✓)
- 12- The object that moves at a constant speed moves at uniform acceleration. (x)
- 13- When the driver of a moving car uses the brakes to stop it after a period of time, its initial speed becomes equal to zero. (x)
- 14- To determine the length, mass and time, we must know the magnitude and the measuring unit. (✓)
- 15- Light moves at a constant speed in the space. (✓)
- 16- Virtual image can be received on a screen. (x)
- 17- Concave mirror is a mirror whose reflecting surface is the inner surface of a sphere. (✓)
- 18- The light ray passing through the center of curvature of the concave mirror is reflected parallel to the principal axis. (x)
- 19- The lens is a transparent medium that reflects the light and it is limited with two spherical surfaces. (x)
- 20- There is only one principal axis of a lens. (✓)
- 21- When an object is placed at the focus of a convex lens, upright image is formed. (x)
- 22- The diameter of curvature of the thick lens face is less than the diameter of curvature of the thin one. (✓)
- 23- Vision defects occur because the eye lens is not always of normal convexity. (✓)
- 24- Increasing the convexity of the eye lens causes long-sightedness. (x)
- 25- Contact lenses are put directly on eye pupil. (x)
- 26- Stars gather into groups to form galaxies. (✓)
- 27- The Sun takes about 220 million years to complete one rotation around the center of the galaxy. (✓)
- 28- In the center of our galaxy a lot of new stars gather surrounded by small stars. (x)
- 29- Saturn planet is the planet of life. (x)

- 30- Primitive organisms (the earliest life) appeared on Earth after formation of the solar system. (✓)
- 31- Our galaxy has a distinctive shape according to the harmony and order of the groups of stars in it. (✓)
- 32- The distances in space measured in kilometer as the distance between stars are very large. (x)
- 33- Fred Hoyle used the fact of explosion of stars to explain evolution of the universe. (x)
- 34- The crossing star theory is more recent in time than the nebular assumptions. (✓)
- 35- The scientist Laplace was affected by the shape of the planet Mercury when formulating his theory. (x)
- 36- The universe is the wide and extended space that contains galaxies. (✓)
- 37- According to the Big Bang theory, within minutes of the beginning of the universe, the ratio between helium and hydrogen gases was 3:1. (x)
- 38- The Nebular theory considered the oldest assumptions that explained the origin of the solar system. (✓)
- 39- Scientists believe that the beginning of the universe was a gaseous small ball of high pressure and temperature. (✓)
- 40- Multicellular living organisms contain two types of cells. (✓)
- 41- The nucleic acid DNA carries the genetic information of the living organisms. (✓)
- 42- Spindle fibers appear during the cell division in the metaphase. (x)
- 43- Meiosis differs from mitosis in that each cell contains half the number of chromosomes of the parent cell. (✓)
- 44- Gametes in living organisms are formed by the division of somatic cells. (x)
- 45- The ratio between the number of chromosomes presents in a rabbit ear cell to the number of chromosomes present in an ovary cell is (2:1). (x)
- 46- If the number of chromosomes in a liver cell of a certain living organism is 32 chromosomes, then the number of chromosomes in a reproductive cell is 16 pairs chromosomes. (✓)

- 47- The Egyptian scientist Mustafa El Said discovered a way to detect the cancer cells by using Nanotechnology. (✓)
- 48- Reproduction by sporogony is a form of sexual reproduction, which is more common in some fungi and some algae. (x)
- 49- Sexual reproduction maintains the genetic structure of the living organisms. (x)
- 50- The unicellular protozoans reproduce by binary fission. (✓)
- *****

6) Correct the underlined words:

- 1- The simplest type of motion is the motion in curved line. (straight)
- 2- If a body takes half the time to cover the double distance, so its speed equals quarter of its original speed. (four times)
- 3- The relative speed is the result of dividing the total distance covered by the total time. (average)
- 4- The speed of the car can be identified directly by using the compass. (speedometer)
- 5- The average speed is the speed of a moving object relative to an observer. (relative)
- 6- The relative speed of a moving car relative to an observer at rest is less than the real speed. (equal to)
- 7- The movement 25 m eastward is considered scalar physical quantity. (vector)
- 8- The magnitude of distance equals the shortest straight line between two positions. (displacement)
- 9- Displacement is characterized by both magnitude and time. (direction)
- 10- If a body moves in a circular path for half a cycle, so the ratio between its displacement and its distance is equal to $\frac{22}{7}$. $\frac{7}{11}$ or $\frac{2}{\pi}$
- 11- If the angle between the incident light ray and the reflected light ray on a plane mirror is 120° , the angle between the incident ray and the reflecting surface will be 60° . (30°)

- 12- The plane mirror is a mirror which its reflecting surface is a part of a hollow sphere. (spherical)
- 13- The plane mirror is placed to the right and left sides of the car's driver. (convex)
- 14- The angle of incidence is larger than angle of reflection. (equal to)
- 15- The focal length of a concave mirror is 5 cm, so its diameter of curvature is 10 cm. (radius)
- 16- If the radius of curvature of a concave mirror equals 30 cm, then its focal length is 60 cm. (15)
- 17- When an object is placed at a distance equals 10 cm in front of concave mirror whose diameter equals 40 cm, a virtual and magnified image is formed. (no image)
- 18- The ratio between the length of the formed image to the length of the body in front of convex mirror is equal to one. (less than)
- 19- The properties of the formed images by the convex lens depend on the length of the object from the lens. (distance)
- 20- When an object placed at distance less than the focal length of a convex lens, the formed image is virtual, inverted and enlarged. (erect)
- 21- The Milky Way galaxy has an elliptical shape. (a spiral)
- 22- Hydrogen and nitrogen gases produced stars, galaxies and the universe over millions of years. (helium)
- 23- Scientists were able to trace the history of the origin of the universe from the first moments of its origin as a result of progress in biology and chemistry. (physics and astronomy)
- 24- The solar system contains a lot of stars. (one star)
- 25- The nebular theory is attributed to Chamberlain. (Laplace)
- 26- The scientist Laplace publish research entitled (World order) about the origin of the universe. (solar system)
- 27- The gaseous line in the crossing star theory forms the stars. (planets)
- 28- The Sun is the origin of the solar system according to modern theory. (crossing star)
- 29- The gametes contain diploid number of chromosomes. (haploid)

- 30- The chromosome consists of two chromatids connected at the cytoplasm. (centromere)
- 31- The nucleolus disappears during the mitotic cell division in telophase. (prophase)
- 32- Gametes in living organisms are produced by the somatic cells during the meiotic division. (reproductive)
- 33- The sperm and the ovum share in the formation of zygote by a ratio 1:2 respectively. (1 : 1)
- 34- Crossing over phenomenon happens in the end of the anaphase I. (prophase I)
- 35- In telophase II of meiotic division, two nuclei are formed, each contains half the original number of chromosomes in the mother cell. (telophase I)
- 36- The ratio between the number of the produced cells from two cellular divisions of a skin cell, and that produced from one cellular division of a testis cell equals 4:2. (4 : 4)
- 37- Ovum is the cell that produced due to the fertilization process. (Zygote)
- 38- Vegetative reproduction is a form of sexual reproduction. (asexual)
- 39- The offspring resulting from sexual reproduction get the genetic traits from one source. (two sources)
- 40- Starfish arms could be regenerated and give a new animal if they contain a part of the bud. (central disc)

7) Cross out the odd word and write the scientific term of others:

- 1- Time / Length / Force / Mass.
➤ Scientific term: **scalar physical quantities.**
- 2- (m/sec) / (m.sec⁻¹) / (km/h) / (m.sec⁻²).
➤ Scientific term: **measuring units of speed.**
- 3- Force / Acceleration / Time / Displacement.
➤ Scientific term: **Vector physical quantities.**
- 4- Virtual image / Upright image / Real image / Image equal in size to object.
➤ Scientific term: **Properties of image formed by the plane mirror.**

5- Real image / Diminished image / Inverted image / Virtual image.

➤ Scientific term: **Properties of image formed by the concave mirror or convex lens.**

6- The eye / Telescope / Solar oven / Medical glass.

➤ Scientific term: **Uses of lenses.**

7- Big Bang theory / Nebular theory / Crossing star theory / Modern theory.

➤ Scientific term: **theories about the evolution of the solar system.**

8- Nervous cells / Skin cells / Stomach cells / Muscles cells.

➤ Scientific term: **Somatic cells that can divide by mitosis.**

9- Sperm / Ovum / Fertilized ovum / Pollen grain.

➤ Scientific term: **gametes that contain half the number of chromosomes of the parent cell.**

10- Budding / Binary fission / Reproduction by seeds / Vegetative reproduction.

➤ Scientific term: **Asexual reproduction.**

8) Mention the difference between (compare):

1- Scalar physical quantity and the vector physical quantity (in term of the definition).

Scalar physical quantity	Vector physical quantity
It is the physical quantity that has magnitude and has no direction.	It is the physical quantity that has magnitude and direction.

2- Force and mass (according to the kind of physical quantity).

Force	Mass
Vector physical quantity.	Scalar physical quantity.

3- Virtual image and real image.

Virtual image	Real image
It is the image which cannot be received on a screen.	It is the image which can be received on a screen.
It is formed as a result of the intersection of the extensions of the reflected light rays.	It is formed as a result of the intersection of the reflected rays.
Usually erect.	Usually inverted.

4- Convex lens and a concave lens in terms of (Definition - The type of the principal focus - The type of the images that is formed).

P.O.C.	Convex lens	Concave lens
Definition	It is a transparent optical piece which is thick at center and less thick at the tips.	It is a transparent optical piece which is thin at center and thicker at the tips.
Focus	Real focus.	Virtual focus.
Images	Real or virtual.	Usually virtual.

5- Long-sightedness and short-sightedness (in terms of reasons and the position of the formed image relative to the retina).

P.O.C.	Long-sightedness	short-sightedness
Reasons	1- Decrease in the eyeball diameter. 2- Decrease in the convexity of the eye lens.	1- Increase in the eyeball diameter. 2- Increase in the convexity of the eye lens.
Formed image	The image formed behind the eye retina.	The image formed in front of the eye retina.

6- Laplace theory, The crossing star theory and Modern theory according to the origin of the solar system.

Laplace theory	Crossing star theory	Modern theory
Nebula.	The Sun.	A star rather than the Sun.

7- Centromere and centrosome.

Centromere	Centrosome
It is the point of connection of the two chromatids of chromosomes.	It forms the spindle fibers during animal cell division.

8- Mitosis and meiosis (according to the type of cells in which the division takes place, importance and resulting cells).

P.O.C.	Mitosis	Meiosis
Occurs in	Somatic cells.	Reproductive cells.
Importance	1- Growth of living organisms. 2- Compensation of the damaged cells. 3- Completing asexual reproduction process.	Production of male and female gametes to complete the sexual reproduction process.
Resulting cells	Two cells, each cell contains the same number of chromosomes of the parent cell (2N).	Four cells, each cell contains half number of chromosomes of the parent cell (N).

9- The prophase of a cell in a plant stem, and the prophase of a cell in an animal skin.

Prophase in a plant stem cell	Prophase in an animal skin cell
The spindle fibers formed from condensing the cytoplasm at the two poles of the cell, because in plant cell there is no centrosomes.	The spindle fibers formed at the centrosomes extending between the two poles of the cell.

10- Formation of gametes in human and flowering plants (according to the type of division and the organ in which it occurs).

Formation of gametes in human	Formation of gametes in flowering plants
Meiotic cell division of reproductive cells in testes and ovaries.	Meiotic cell division of reproductive cells in anthers and ovaries.

11- Cancer and tumor (in term of the definition).

Cancer	Tumor
A dangerous disease occurs when the body cells are divided continuously without controlling.	A mass of cells that produced due to the abnormal continuous division of cells.

12- The yeast fungus and the hydra (according to the similarities and differences).

P.O.C.	Yeast fungus	Hydra
Similarities	Both reproduce by budding.	
Differences	Unicellular organism.	Multicellular organism.

13- Starfish and Bread mold fungus (in terms of the condition for reproduction).

Starfish	Bread mold fungus
Reproduction occurs when the missing arm contains a part of the central disc.	Reproduction occurs when the sporangium ruptures and spores fall on a suitable environment such as wet bread.

9) Give an example for:

- | | |
|---|------------------------|
| 1- Scalar physical quantity. | (Distance) |
| 2- Vector physical quantity. | (Displacement) |
| 3- An optical piece used in the manufacture of the telescope. | (Concave mirror) |
| 4- An optical piece used in the right and left of the car driver. | (Convex mirror) |
| 5- Theory explaining the origin of the universe. | (Big Bang theory) |
| 6- Theory explaining the origin of the solar system from the Sun. | (Crossing star theory) |
| 7- Reproduction by binary fission. | (Bacteria) |
| 8- Multicellular organism reproduces asexually by budding. | (Sponge) |
| 9- Unicellular organism reproduces asexually by budding. | (Yeast fungus) |

10) Give reason for:

- 1- The motion of a train is an example of a motion in one direction.
- Because the train moves forward or backward in a straight path or curved path or combination of both.

2- It is hard for a car to apply regular speed practically.

- Because the speed of the car changes according to the conditions of the road.

3- The object speed increases by decreasing the time needed to cover a certain distance.

- Because speed is inversely proportional to the time, where $\text{speed} = \text{distance} \div \text{time}$.

4- A car moving at a certain speed appears static to an observer moving by the same speed and in the same direction.

- Because the relative speed equals the difference between the real speed and the observer's speed equals zero.

5- Physicists use mathematical methods like graphs and tables.

- To predict the relation between certain physical quantities.
- To understand practical results.
- To describe the physical phenomena in an easier way.

6- (Distance – Time) graph of an object that moves at a uniform speed is a straight line passing through the origin point.

- Because the distance is directly proportional to the time when the object moves at a constant speed.

7- The person who runs for minutes then walks for other minutes, moves with negative acceleration.

- Because the person's speed decreases as time passes.

8- Displacement is a vector physical quantity.

- Because it is identified by magnitude and direction.

9- When an object moves where its ending point is its starting point, then its velocity equals zero.

- Because its displacement equals zero, where $\text{velocity} = \text{displacement} / \text{time}$.

10- Speed and direction of the wind are important to pilots of the planes.

- To calculate the time of the trip and the amount of the fuel consumed.

11- The body which moves at acceleration can't move at a regular speed.

- Because its speed changes as time passes.

12- The object which moves at a uniform speed, its acceleration equals zero.

➤ Because its speed doesn't change as time passes.

13- The image formed by the plane mirror can't be received on a screen.

➤ Because it is a virtual image formed behind the plane mirror, where the extensions of the reflected light rays are intersected.

14- The word "Ambulance" is written in a laterally inverted way on the ambulance car.

➤ Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.

15- Concave mirror is used to generate high heat energy.

(The concave mirror is called converging mirror.)

➤ Because the concave mirror collects (converges) the reflected light rays falling on it in one point (focus) generating high heat energy.

16- Archimedes used a concave mirror to burn the sails of the Roman fleet.

➤ Because concave mirror is converging mirror that collected the sun rays and directed them towards the sails of ships to generate extreme heat that burns these sails.

17- When an object is placed at a distance equals the focal length of a concave mirror, the image will be in the form of a light spot (no image is formed).

➤ Because the reflected light rays and also their extensions are parallel, so they don't intersect.

18- A convex mirror is placed at the corners of narrow roads.

➤ To form virtual, erect and diminished image, to monitor cars movement and to avoid accident.

19- A convex mirror is placed on railway and metro platforms.

➤ To form virtual, erect and diminished image, to avoid passenger injury during opening and closing the metro doors.

20- The lens has two foci, while the spherical mirror has one focus.

➤ Because lens has two spherical surfaces, while the spherical mirror has one spherical surface.

21- The long-sightedness is corrected by using a convex lens.

- Because the convex lens collects the rays coming from a near object, so the image of the object is formed on the retina.

22- Our galaxy is called Milky Way galaxy.

- Because it appears in the sky at night as a splashing milk or spreading straw.

23- Sometimes a star glows in the sky for a short time to become the brightest star in the sky.

- Due to sudden explosion of a star due to the huge nuclear reactions that occur in it.

24- The universe in a state of continuous expansion.

- Due to continuous separation between galaxies in space as a result of their regular movement.

25- The nebula lost its sphere form and became in a form of a flat rotating disk.

- Due to the effect of centrifugal force that resulted from the rotation of the nebula around itself.

26- Interphase precedes the cellular division.

- Because interphase has important roles before starting cellular division, which are occurrence of some important biological processes and duplicating the genetic material (DNA).

27- The cells of a plant stem need mitosis, while the plant anther needs meiosis.

- Because the plant stem needs to grow and to compensate the damaged cells, while plant anther needs to produce pollen grains for reproduction.

28- Shrinking of spindle fibers during the anaphase of mitosis.

- To form two identical groups of chromosomes, one at each pole of the cell.

29- The changes that occur in telophase of mitotic division are called adverse changes.

- Because they inverse the changes that occur in prophase.

30- Meiotic division is called by reduction division.

- Because the produced cells contain half the number of chromosomes of the original cell.

31- Asexual reproduction keeps the genetic structure of the living organism.

- Because it takes place by only one individual through mitotic division, producing individuals having a complete copy of genetic traits of the parent individual.

32- There are no new races of grape when they reproduce by vegetative reproduction.

- Because the vegetative reproduction occurs through mitotic division in which the new offspring obtains a complete copy of the parent genetic material.

33- Zygote contains the complete hereditary material.

- Because zygote ($2N$) produced from combination of a male gamete (N) and a female gamete (N).

11) What happens when ... ? (What are the results of ... ?)

1- The time taken by a moving body increases to double to cover half the distance. (According to the speed)

- The speed of the moving body decreases to quarter.

2- The object covers unequal distances at equal periods of time.

- The object will move at irregular speed.

3- The speed of an object changes by equal values through equal periods of time.

- The object will move with a uniform acceleration.

4- A body moves with uniform speed. (According to the acceleration)

- The acceleration equals zero.

5- The final speed of a moving body is greater than its initial speed.

- The body moves by positive uniform acceleration.

6- An object moves in a straight line in one direction.

(according to the speed and the velocity)

- Speed will equal velocity in magnitude.

7- A plane was traveling against the wind. (according to the plane's velocity, time taken for the flight and amount of fuel consumed)

- The plane's velocity decreases, while the time taken for the flight and the amount of fuel consumed increase.

8- A light ray when incident on a concave mirror passing through its center of curvature.

(An incident light ray falls perpendicular on a reflecting surface of a plane mirror.)

- It reflects on itself where the angle of incidence equals the angle of reflection equals zero.

9- Placing a paper at the focus of convex lens that is directed at sunlight.

- Convex lens can converge and concentrate the parallel rays of sunlight on the paper, so the paper will burn.

10- The fall of a beam of light rays parallel to the principle axis on a concave lens.

- The extensions of the diverged refracted light rays are met at the virtual focus of lens.

11- Light ray falls through the optical center of the lens.

- It passes through the lens without refraction.

12- The body is placed at the focus of the concave mirror.

- No image for a body is formed.

13- The object is put at any distance from a convex mirror.

- A virtual, diminished and upright image of an object behind the mirror is formed.

14- The diameter of the eyeball is greater than normal.

- The person defected with short-sightedness.

15- The radius of curvature of the surface of the eye lens increases than normal.

- The focal length for the eye lens increases, so the convexity of the eye lens surface decreases, and the person defected with long-sightedness.

16- The infection of the eye with the cataract disease.

- The vision becomes difficult as a result of the darkness of the eye lens.

- 17- Galaxies move away from each other as time passes.
- The universe is in a state of continuous expansion.
- 18- The fusion of atomic particles after several minutes of the Big Bang.
- Gaseous clouds of hydrogen and helium are produced with a percentage of 75 % and 25 % respectively, then through millions of years these gases produce the galaxies, stars and universe.
- 19- The nebula lost its temperature in Laplace's opinion.
- Its size contracted and its revolving speed around itself increased.
- 20- Explosion of the expanded part of the Sun faced the crossing star.
(according to Chamberlain and Moulton theory)
- The Sun escaped from the gravity of the crossing star and a gaseous line was formed of a great length from the Sun until the last planets.
- 21- The gaseous cloud is cooled.
(in Fred Hoyle theory)
- It contracts and forms the planets.
- 22- Removing the nucleus of a somatic cell.
- The cell can't divide by mitosis.
- 23- The cell does not pass through the interphase before it enters its mitotic division.
- The genetic material will not be duplicated and each resulting cells will not obtain a complete copy of genetic material.
- 24- Absence of the centrosomes from an animal cell.
- The spindle fibers will not form and the cell division will not occur.
- 25- The parts of the two inner chromatids of each tetrad are exchanged in the first prophase in meiotic division.
- Occurrence of crossing over phenomenon, that works on the variation of genetic traits among the members of the same species.
- 26- An ovary cell divides meiotically.
- It will produce 4 cells (ova); each cell contains half the number of chromosomes of the ovary cell.

27- A person that infected with liver fibrosis disease and needs a liver doner.
(according to the doner person affected with any harm? And why?)

- The doner person will not be affected with any harm.
- Because his liver is completed due to the occurrence of many mitotic cell divisions.

28- Human skin gets injured or part of it is cut off.

- The damaged cells will be compensated by mitotic cell division.

29- Putting a yeast fungus in a warm sugary solution.

- The yeast fungus reproduces asexually by budding forming a new fungus separated from the parent cell or it remains connected to the parent cell forming a colony.

30- Starfish loses one of its arms, which contains a part of the central disc.
(for the starfish and for his lost arm)

- The starfish will compensate the lost arm by regeneration.
- The lost arm will reproduce by regeneration forming a new complete starfish.

31- Sporangia of a bread mold fungus rupturing.

- A large number of spores are released, and when spores fall on a suitable environment they grow by mitotic division producing a new fungus identical to the parent.

32- Fusion of a sperm (male gamete) with an ovum (female gamete).

- A zygote is produced which contains the complete number of chromosomes of the living organism.

12) What is the importance (use) of ... ?

- 1- Speedometer:** It used to identify the speed of car and planes directly.
- 2- Concave mirror:** It used in pocket torch and front lights of cars to reflect the light of the lamp, and used in solar ovens to heat food and water.
- 3- Convex mirror:** It used at shopping centers, cars parks and in the right and left sides of the car driver.
- 4- Contact lenses:** It used to correct vision defects instead of medical glasses.
- 5- Light year:** a unit used to measure the distances between celestial bodies.

- 6- **Solar telescope:** forms a complete picture for the Sun.
- 7- **Hubble telescope:** collects photos for the universe that give us details about its state since millions of years, which allow astronomers to study the evolution of the universe after the Big Bang.
- 8- **Centrosome in the animal cell:** Formation of the spindle fibers.
- 9- **Crossing over phenomenon:** it works on the variation of genetic traits among the members of the same species.
- 10- **Second meiosis division:** increase the number of the produced cells from first meiotic division to produce gametes.
- 11- **Reproduction process:** produces new individuals of the same kind, to keep the continuity of their species and to avoid their extinction.
- 12- **Vegetative reproduction:** it can occur by using plant's vegetative organs such as leaves, roots and stems, without the need of seeds to produce new plants identical to the parent plant.

13) Problems:

- 1- A ball is far from player (A) 50 m who runs with a speed of 3 m/s and far from player (B) 35 m who runs with a speed of 2 m/s, which player reaches the ball firstly (A) or (B)? (Showing the method of solution)

$$\text{Time taken by player (A)} = \frac{\text{Distance (d)}}{\text{speed (v)}} = \frac{50}{3} = 16.6 \text{ sec.}$$

$$\text{Time taken by player (B)} = \frac{\text{Distance (d)}}{\text{speed (v)}} = \frac{35}{2} = 17.5 \text{ sec.}$$

The player (A) reaches the ball first, because he takes shorter time than player (B).

- 2- A body moves in a straight line at a uniform speed and covered 150 meter in 10 second, then returns to the starting point in a time of 30 second. Calculate the average speed of this object during the return trip and the whole trip.

$$(\bar{V}) \text{ during the return trip} = \frac{\text{Total Distance (d)}}{\text{Total Time (t)}} = \frac{150}{30} = 5 \text{ m/sec.}$$

$$(\bar{V}) \text{ during the whole trip} = \frac{\text{Total Distance (d)}}{\text{Total Time (t)}} = \frac{150+150}{10+30} = 7.5 \text{ m/sec.}$$

- 3- A car moves on a straight road covering a distance of 90 km, where it covers $\frac{1}{3}$ distance with a speed of 25 km/h and the rest distance with a speed of 75 km/h, calculate the average speed by which the car moves.

$$d_1 = \frac{90}{3} = 30 \text{ km} , V_1 = 25 \text{ km/h} , d_2 = 90 - 30 = 60 \text{ km} , V_2 = 75 \text{ km/h}$$

$$t_1 = \frac{\text{Distance (d)}}{\text{speed (v)}} = \frac{30}{25} = 1.2 \text{ sec.}$$

$$t_2 = \frac{\text{Distance (d)}}{\text{speed (v)}} = \frac{60}{75} = 0.8 \text{ sec.}$$

$$\text{Average speed } (\bar{V}) = \frac{\text{Total Distance (d)}}{\text{Total Time (t)}} = \frac{90}{1.2+0.8} = 45 \text{ m/sec.}$$

- 4- Two bodies A and B, each move at a constant speed as follows:

Body A moves according to the relation $d \text{ equals } = \frac{t}{2}$

Body B moves according to the relation $d \text{ equals } = 2t$

Calculate the ratio between the speed of body B to the speed of body A, knowing that the time of the movement is constant.

Speed is directly proportional to distance so:

$$\frac{V_B}{V_A} = \frac{dB}{dA} = \frac{2t}{\frac{t}{2}} = 4$$

- 5- Calculate the relative speed of a car if its speed 80 km/h, relative to an observer moving in the same direction by speed 50 km/h.

The relative speed = The actual speed – The observer speed.

$$= 80 - 50 = 30 \text{ km/h.}$$

- 6- The relative speed of a car is 80 km/h, calculate the actual speed of the car when observer moves in the same direction of the car with a speed of 30 km/h.

The relative speed = The actual speed – The observer speed.

$$80 = \text{The actual speed} - 30$$

$$\text{The actual speed} = 80 + 30 = 110 \text{ km/h}$$

- 7- When the relative speed of a car equals three times the speed of an observer who moves at a speed equals 10 km/hr.

When the car moves with speed:

- Equals 40 km/h in the same direction of the observer.
- Equals 20 km/h in the opposite direction to the observer.

- 8- When the relative speed of a moving object equals double (twice) the value of its actual speed.

When the observer moves in the opposite direction at the same speed of the moving object (object speed = observer speed).

- 9- Two trains are moving on parallel tracks, in opposite directions. If the speed of the first train is 60 km/h, and the speed of the second train is 90 km/h, calculate the speed of the first train as it is observed by the passengers of the second train.

The relative speed = The actual speed + The observer speed.

$$= 60 + 90 = 150 \text{ km/h}$$

- 10- A car moves at a speed of 30 m/sec., and when the driver uses the brakes, the car stops after 10 sec. Calculate the acceleration by which the car moves from the moment of using the brakes and mention the type of acceleration.

$$V_1 = 30 \text{ m/sec.}, \quad V_2 = 0, \quad t = 10 \text{ sec.}$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t} = \frac{0 - 30}{10} = -3 \text{ m/sec}^2.$$

The type of acceleration: negative acceleration.

- 11- A car moved at a regular speed of 20 m/s for 10 sec., then the driver applied the brakes, its speed decreased at a rate of 2 m/s^2 , calculate the car speed after 3 sec from using the brakes.

$$V_1 = 20 \text{ m/sec.}, \quad t_1 = 10 \text{ sec.}, \quad a = -2 \text{ m/sec}^2, \quad t_2 = 3 \text{ sec.}$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t}$$

$$-2 = \frac{V_2 - 20}{3}$$

$$V_2 - 20 = -6, \quad V_2 = 14 \text{ m/sec.}$$

- 12-** An object moves by speed of 10 m/s, calculate the time required for its speed to become double, knowing that the object moves with an acceleration equals 2 m/s².

$$V_1 = 10 \text{ m/sec.}, \quad V_2 = 20 \text{ m/sec}, \quad a = 2 \text{ m/sec}^2$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t}$$

$$2 = \frac{20 - 10}{t}$$

$$t = \frac{20 - 10}{2} = 5 \text{ sec.}$$

- 13-** A car moved at a constant speed and covered a distance of 4800 meters in 2 minutes, then the driver pressed the brakes and its speed decreased at a rate of 2 m/s every 4 seconds, calculate the time required for the car to stop.

$$V_1 = \frac{4800}{2 \times 60} = 40 \text{ m/sec.}, \quad V_2 = 0, \quad a = \frac{-2}{4} = -0.5 \text{ m/sec}^2$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t}, \quad t = \frac{0 - 40}{-0.5} = 80 \text{ sec.}$$

- 14-** A body moved with a constant acceleration for 11 seconds and its speed reached 3.6 km/h after five seconds. At the end of its movement, the speed reached 1.3 m/s. Calculate the speed of the body at which it starts to move.

First calculate acceleration:

$$V_1 = 3.6 \text{ km/h} = 3.6 \times \frac{5}{18} = 1 \text{ m/sec.}, \quad V_2 = 1.3 \text{ m/s}, \quad t = 11 - 5 = 6 \text{ sec.}$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t} = \frac{1.3 - 1}{6} = 0.05 \text{ m/sec}^2.$$

Second calculate the speed of the body at which it starts to move:

$$V_2 = 1.3 \text{ m/sec.}, \quad t = 11 \text{ sec}, \quad a = 0.05 \text{ m/sec}^2$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t}$$

$$0.05 = \frac{1.3 - V_1}{11}$$

$$1.3 - V_1 = 0.55, \quad V_1 = 0.75 \text{ m/sec.}$$

- 15-** If a person stood on the top of a building its height equals 20 m, and he throws a ball up to height equals 10 m, then the ball falls down and stopped on Earth's surface below the building, find both the distance and the displacement covered by the ball.

- Distance = 10 + 30 = 40 m.
- Displacement = 20 m in downward direction.

- 16-** Calculate the displacement of an object when it makes half-circle and when it makes a complete circle on the circumference of a circle with a diameter of 7 km.

- The displacement when it makes half circle = the diameter = 7 km.
- The displacement when it makes complete circle = zero

- 17-** Calculate the angle of incidence and also the angle between the incident light ray and the reflected ray, if the angle between the incident ray and the mirror surface equals 30°.

- The angle of incidence = $90^\circ - 30^\circ = 60^\circ$
- The angle between the incident light ray and the reflected ray
= $60^\circ + 60^\circ = 120^\circ$

- 18-** An object was placed in front of plane mirror and the distance between the object and its image was 5 meter. When the mirror moves a certain distance, the distance between the object and its new image becomes 4 meter. Determine the distance that the mirror moves, and its direction relative to the object.

- Difference in the distance between the object and its image in the 2 positions = $5 - 4 = 1 \text{ m.}$
- The distance that the mirror moves = 0.5 m, toward the body.

- 19- An object placed in the middle of the distance between two mirrors one of them is concave and the other is plane, the distance between them is 16 cm. an image equal to the object was formed in both cases. Detect the position of the body from the concave mirror and calculate its focal length.

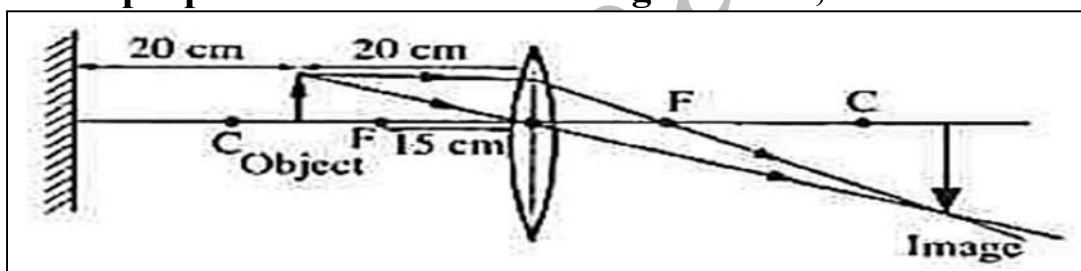
Formation of an image equal to the object by the concave mirror means that the object is at the center of curvature of mirror.

Radius of curvature = $16 \div 2 = 8$ cm.

Focal length = $8 \div 2 = 4$ cm.

- 20- An object is placed at the mid distance between a plane mirror and the optical center of a convex lens its diameter of curvature equals 60 cm, an image for the object is formed by the plane mirror at a distance of 20 cm from it, show by drawing the properties of the formed image of the object by the convex lens.

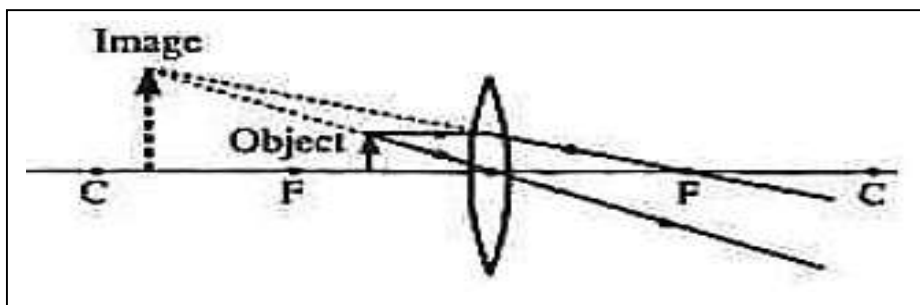
- 21- The properties of the formed image are real, inverted and magnified.



- 22- When an object is placed in front of a convex lens, no image appears on the screen. Detect the position of the body relative to the lens, draw the path of the rays and mention the properties of the formed image.

The object is placed at a distance smaller than the focal length.

The formed image is virtual, erect and magnified.



23- Calculate the number of resulting cells and the number of chromosomes in each cell, if two successive mitotic divisions occur for a somatic cell contains 20 chromosomes.

- The number of resulting cells = 4 cells.
- Number of chromosomes in each cell = 20 chromosomes.

24- An ovary cell in a flower with a number of chromosomes (2 N) divided by meiotic cell division. Calculate the total number of chromosomes of the resulting cells in telophase II.

- The first meiotic division produces 2 gametes; each has half number of chromosomes (N).
- The second meiotic division produces 4 gametes, each has (N) chromosomes.

- The total number of chromosomes of the resulting cells in telophase II

$$= 4 \times N = 4N$$

25- If all the arms of 50 individuals starfish were cut off and 35 of them their cut arms containing a part of the central disc, while the rest of the individuals their cut arms not containing a part of the central disc, what is the total number of the resulting complete organisms?

- Organisms that reproduce by regeneration

$$= 35 \text{ starfish} \times 5 \text{ arms} = 175 \text{ starfish.}$$
- Organisms that compensate their missing arms by regeneration = 15.
- The total number of the resulting complete organisms

$$= 175 + 15 = 190 \text{ starfish.}$$

14) Study the following figures then answer:

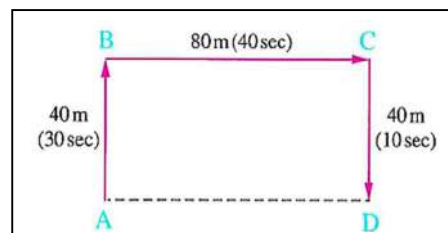
1- Study the opposite figure then calculate:

a) Displacement.

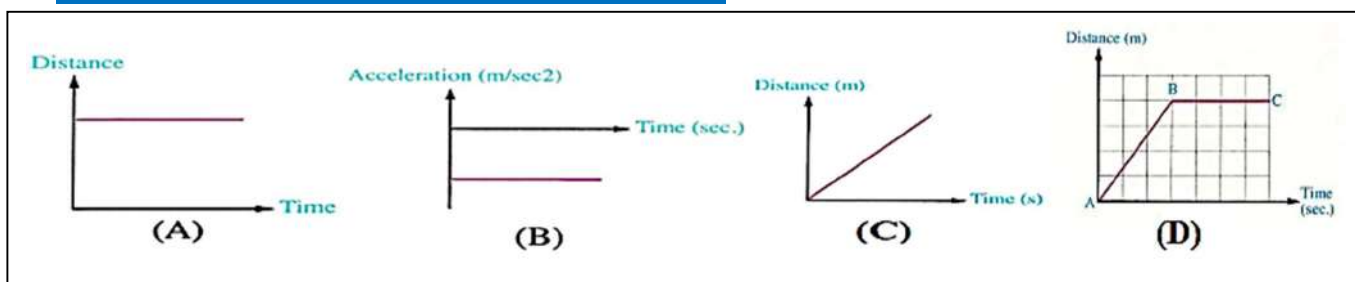
- 80 m in east direction (AD).

b) Velocity.

- Average velocity $\vec{v} = \frac{\text{displacement } \vec{d}}{\text{Total Time (t)}} = \frac{80}{30+40+10} = 1 \text{ m/sec,}$
in east direction (AD).



2- Study the opposite figure then answer:



a) Describe the motion of the object in:

- Figure (A).
 - An object at rest.
- Figure (B).
 - An object moves by a negative uniform acceleration.
- Figure (C).
 - An object moves by regular speed.
- Figure (D).
 - An object moves by regular speed and then stops moving.

b) What is the value of speed in figure (A)?

- Equals zero.

c) In figure (D) the magnitude of the speed of the object in the interval (BC) is equal to the magnitude of in the interval (AB).
(distance – time – speed – acceleration)

d) What is the value of acceleration in figure (C)?

- Equals zero.

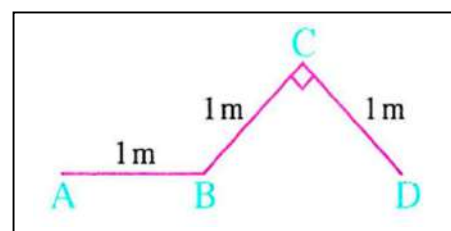
3- Study the opposite figure then calculate:

a) The distance covered by this object.

- Distance = $1 + 1 + 1 = 3$ m.

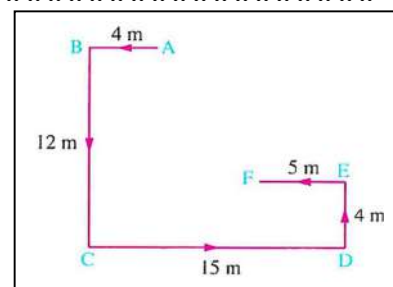
b) The displacement of this object.

- $BD = \sqrt{1^2 + 1^2} = \sqrt{2}$ m.
- The displacement = $1 + \sqrt{2}$ m in east direction (AD).



4- In the opposite figure:

An object moves from point A to point F passing by points B, C, D, and E in (8 sec.)
Calculate the average speed and average velocity.



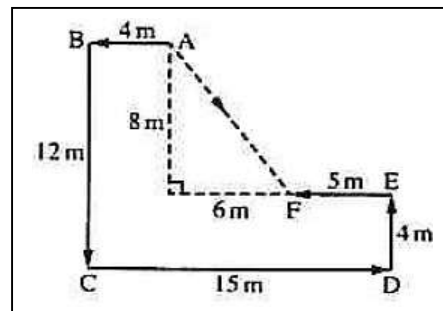
$$\text{Average speed } (\bar{V}) = \frac{\text{Total Distance (d)}}{\text{Total Time (t)}} = \frac{4+12+15+4+5}{8} = 5 \text{ m/sec.}$$

$$\text{Displacement} = \sqrt{8^2 + 6^2} = \sqrt{100} = 10 \text{ m.}$$

in the southern east direction (AF).

$$\text{Average velocity} = \frac{\text{Displacement}}{\text{Total Time (t)}} = \frac{10}{8} = 1.25 \text{ m/sec.}$$

in the southern east direction (AF).

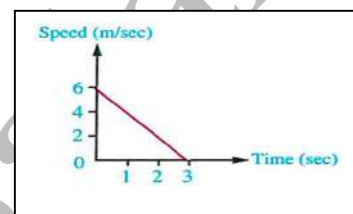


5- Study the opposite figure then calculate:

The acceleration by which the object moves.

$$V_1 = 6 \text{ m/sec} , V_2 = 0 , t = 3 \text{ sec}$$

$$\text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t} = \frac{0 - 6}{3} = -2 \text{ m/sec}^2.$$



6- In the opposite figure:

An object moves with uniform speed from point (A) to point (B) and it covers 60 m distance in 12 sec., then it moves with uniform acceleration from point (B) to point (C) according to the relation $[a = 20 + t]$ calculate:

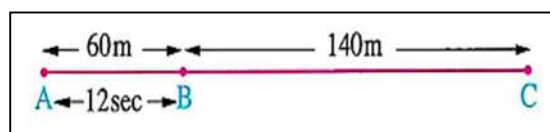
a) The regular speed in the period AB.

$$\text{Speed (V)} = \frac{\text{Distance (d)}}{\text{Time (t)}} = \frac{60}{12} = 5 \text{ m/sec.}$$

b) The final speed in the period BC.

$$V_1 = 5 \text{ m/sec} , a = \frac{20}{t} , \text{Acceleration (a)} = \frac{V_2 - V_1}{\Delta t}$$

$$\frac{20}{t} = \frac{V_2 - 5}{\Delta t} , V_2 = 20 + 5 = 25 \text{ m/sec.}$$



7- In the opposite figure:

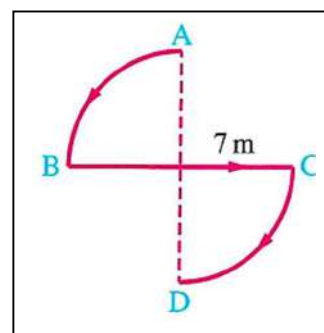
A car is moving in a circular path with a radius of 7m and circumference of 44 m from point (A) to point (D) through points (B) and (C) in 10 seconds. Calculate the average speed and velocity.

$$AB = CD = \frac{1}{4} \times \text{circumference} = \frac{1}{4} \times 44 = 11 \text{ m.}$$

$$\text{Total distance} = AB + BC + CD = 11 + 14 + 11 = 36 \text{ m.}$$

$$\text{Average Speed } (\bar{V}) = \frac{\text{Total Distance (d)}}{\text{Total Time (t)}} = \frac{36}{10} = 3.6 \text{ m/sec.}$$

$$\text{Velocity } (\vec{V}) = \frac{\text{displacement } \vec{d}}{\text{Total Time (t)}} = \frac{14}{10} = 1.4 \text{ m/sec.}$$



8- The opposite graph represents the movement of two objects (X) and (Y):

a) Which of them starts its motion from rest?

➤ Object (X).

b) Which of them moves at a greater acceleration?

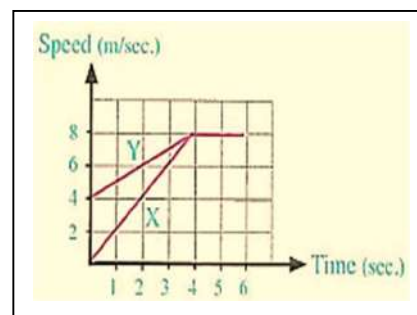
➤ $a_x = \frac{v_2 - v_1}{\Delta t} = \frac{8 - 0}{4} = 2 \text{ m/sec}^2$.

➤ $a_y = \frac{v_2 - v_1}{\Delta t} = \frac{8 - 4}{4} = 1 \text{ m/sec}^2$.

➤ Object (X) moves at a greater acceleration.

c) When do the two objects start moving at a regular speed ? And what is its value ?

➤ After 4 seconds, $V = 8 \text{ m/sec}$.

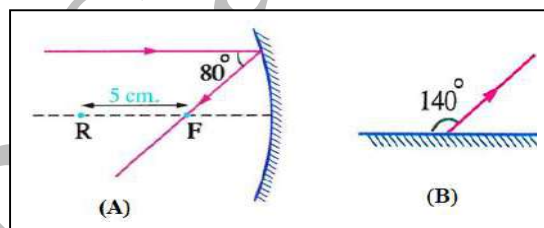


9- In the opposite figure complete:

a) The type of mirror (A) is concave mirror while that of mirror (B) is plane mirror.

b) The incident angle in mirror (A) equals 40° while the incident angle in mirror (B) equals 50°.

c) The focal length of mirror (A) equals 5 cm, while the diameter of curvature equals 20 cm.

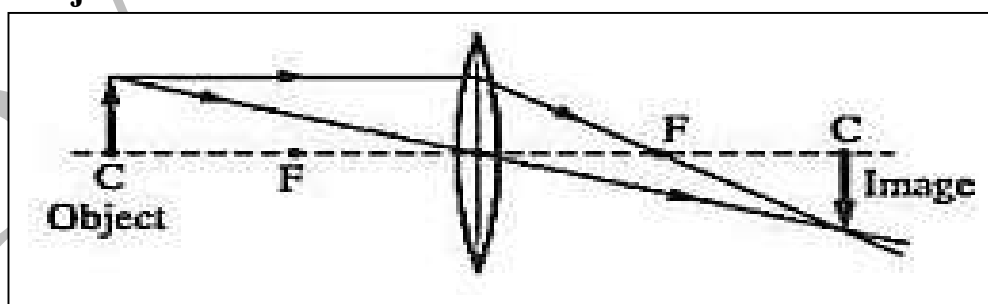
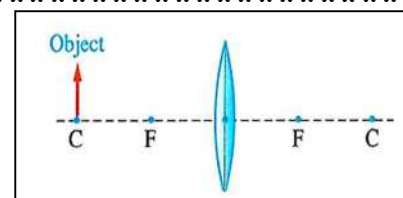


10- In the opposite figure:

a) What is the type of lens?

➤ Convex lens.

b) Explain the path of the rays forming the image of the object.

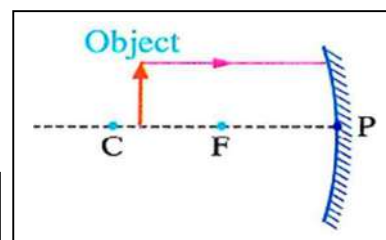
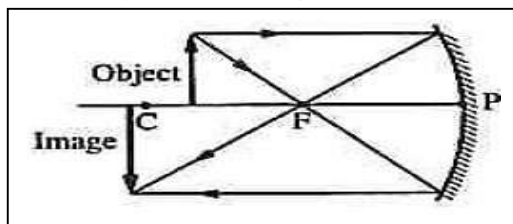


c) What are the properties of the formed image of the object?

➤ Real, inverted and equal in size to the object.

11- The figure represents image formation in a concave mirror.

a) Explain the path of the rays forming the image of the object.



b) What are the properties of the formed image of the object?

➤ Real, inverted and magnified.

12- Study the opposite figure then calculate:

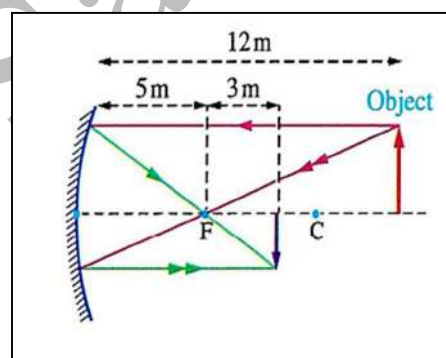
The distance that the object moves towards the mirror in order to form real, inverted and equal image.

➤ To form real, inverted and equal image, the object must be at the center of curvature,

➤ $f = 5 \text{ cm}$

➤ $r = 2 \times f = 2 \times 5 = 10 \text{ cm.}$

➤ The distance that the object moves toward the mirror = $12 - 10 = 2 \text{ cm.}$



13- Study the opposite figure then answer:

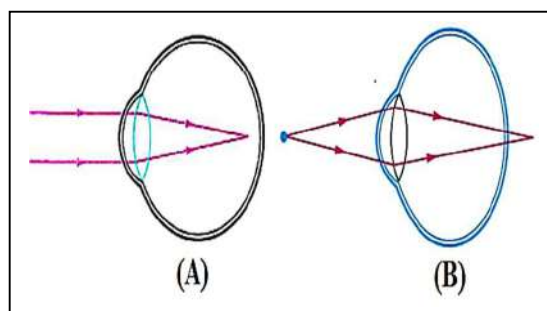
a) The figure (A) represents a vision defect known as short-sightedness.

b) The figure (B) represents a vision defect known as long-sightedness.

c) Explain how does the defected eyes see the near and far objects in both defects.

➤ In fig. (A) near objects can be seen clearly but far objects seem distorted.

➤ In fig. (B) far objects can be seen clearly but near objects seem distorted.



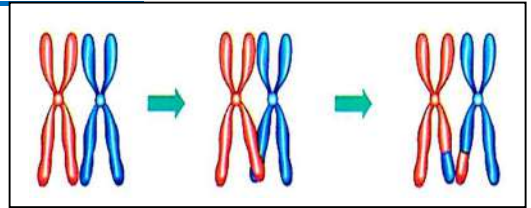
14- The figure represents one of the vital phenomena:

a) What is the name of this phenomenon?

➤ Crossing over phenomenon.

b) How it works?

➤ It works by the exchange of genes (that carry genetic traits) between the two homologous chromatids of the chromosome, and distributing them randomly in the gametes.



15- Study the opposite figure then answer:

a) Mention the type of cell division in fig (A).

➤ Meiotic cell division (Meiosis).

b) Mention the name of the phase in fig (A).

➤ Metaphase I.

c) Mention the type of cell division in fig (B).

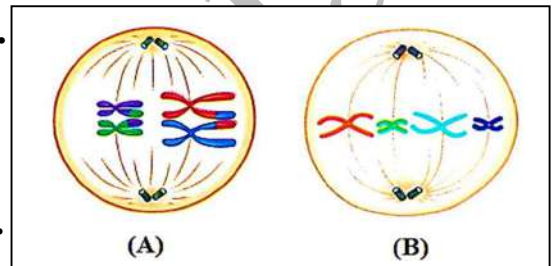
➤ Mitotic cell division (Mitosis).

d) What is the name of the phase that follows the phase in fig (B).

➤ Anaphase.

e) What is the final result of the process in fig (B) after ending all phases?

➤ Two cells, each one contains the same number of chromosomes of the parent somatic cell.



16- Study the opposite figure then answer:

a) Mention the name of the phase.

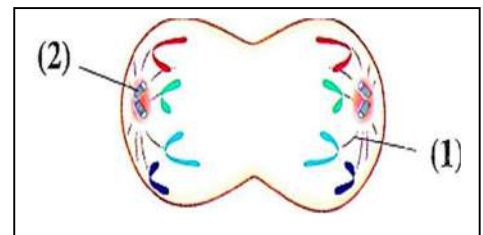
➤ Anaphase.

b) What is the importance of structure (1)?

➤ Connect the centromere of chromosome to the centrosome, and during anaphase it begins to shrink so two identical groups of chromosomes are formed.

c) What is the importance of structure (2)?

➤ Formation of a network of filamentous fibers called spindle fibers.



17- Study the opposite figure then answer:

a) Mention the name of the living organism.

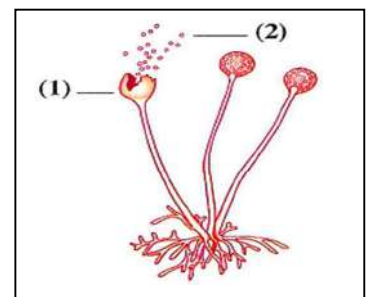
➤ Bread mold fungus.

b) Label: (1) Sporangium.

(2) Spores.

c) What is the method of its reproduction?

➤ Spore propagation.



حمل الآن

مجانا وحصريا

المراجعة رقم (4)

الترم الاول



Prep. 3

Question 1

Choose the correct answer:

- The crossing over phenomenon takes place at the end of
a. prophase I. b. metaphase I. c. anaphase I. d. telophase I.
- The ability of some animals to compensate their missing parts is called the
a. budding. b. regeneration.
c. sporogony. d. sexual reproduction.
- The line between the centers of curvature of the lens passing by the optical centre of the lens is called the
a. focal length. b. principal axis.
c. secondary axis. d. radius of curvature
- If the speed of a car is 72 km/hour, this means that its speed equalsm/sec
a. 18 b.20 c.40 d. 0.072
- The spindle filaments appear during cell division in
a. telophase. b. interphase. c. prophase. d. metaphase
- If the chromosomal number in the male gamete of a living organism is 20 so, the chromosomal number in the liver cell equals
a. 10 chromosomes. b. 20 pairs chromosomes.
c. 10 pairs of chromosomes d. 40 pairs chromosomes.

7. established the modern theory
a. Laplace b. Fred Holye c. Moulton d. Chamberlain
8. The image of the object that lies at the center of curvature in concave mirror is
a. real, inverted and enlarged.
b. real , upright and equal to the object.
c. real, inverted and equal to the object.
d. virtual, upright and equal to the object.
9. The centromere of each chromosome split longitudinally and the spindle fibers contract in mitosis during
a. prophase. b. metaphase c. anaphase. d. telophase.
10. The ratio of the number of chromosomes in the gamete to the number of chromosomes in the origin cell is
a. 1:2 b. 2:1 c. 1:1 d. 3:1
11. When the body covers equal distances at unequal periods of time, the speed will be
a. regular b. decelerated. c. accelerated. d. irregular.
12. All the following cells contain full copy of genetic material except
a. somatic cell b. bud. c. zygote. d. pollen grain.
13. The real speed of a car whose speed appears to be 50 km/h to an observer moving in opposite direction at a speed of 30 km/h is..... km/h.
a. 20 b. 30 c. 50 d. 80

14. Uniform acceleration means that the object speedby equal values through equal periods of time.
- a. increases only
 - b. decreases only
 - c. increases or decreases
 - d. doesn't change
15. From the scalar physical quantities is the
- a. acceleration.
 - b. time.
 - c. velocity.
 - d. displacement.
16. The object moves at a constant speed when
- a. it moves at a constant acceleration.
 - b. it covers equal distances at unequal times.
 - c. it covers equal distances at equal times.
 - d. no correct answer.
17. A concave mirror with a focal length of 20 cm, and the object is placed at a distance of 50 cm from the mirror, the image is formed at a distance
- a. more than 40 cm.
 - b. more than 20 cm and less than 40 cm
 - c. equals 20 cm.
 - d. equals 60 cm.
18. Yeast fungus reproduces asexually by
- a. regeneration.
 - b. binary fission.
 - c. budding.
 - d. sexual reproduction
19. The solar system consists of the Sun and planets revolve around it
- a. 10
 - b. 8
 - c. 9
 - d. 7
20. The image formed by is always virtual, erect and diminished
- a. convex mirror
 - b. plane mirror
 - c. concave lens
 - d. a and c

a. convex lens
b. concave mirror
c. spherical mirror
d. plane mirror.

23. The is the phase in which the cell is prepared for division by doubling the genetic material .

a. prophase b. interphase c. metaphase d. anaphase

25. The scientist who established the nebular theory is
a. Chamberlain. b. Moulton. c. Fred Hoyle. d. Laplace.

27. of the Sun controlled the orbits of the planets around it
a. temperature b. rotation speed c. attraction force d. glowing

28. A doctor advised a person who has a sight defect to use glasses with convex lenses it means that this person suffers from
- a. a decrease in the convexity of the eye lens surface.
 - b. an increase in the convexity of eye lens surface.
 - c. an increase in the eyeball diameter.
 - d. disability of seeing far objects clearly.
29. Reproduction by spores occurs in all the following, except.....
- a. bread mold.
 - b. fungus.
 - c. starfish
 - d. mushroom.
30. An observer in a moving car with 50 km/h was observing a moving car with 40 km/h in the same direction so, the observed speed of the 2nd car is
- a. 90 km/h
 - b. 10 km/h.
 - c. 70 km/h.
 - d. 100 km/h.
31. A short-sighted person sees the far object distorted as their images formed
- a. on the retina.
 - b. behind the retina.
 - c. in front of the retina.
 - d. in front of the lens.
32. Protozoan that reproduces by
- a. spore propagation
 - b. budding
 - c. regeneration.
 - d. binary fission
33. considered as a source of genetic variation
- a. vegetative reproduction
 - b. budding
 - c. sexual reproduction
 - d. regeneration

34. (Speed - time) graph for a regular motion at a constant speed is a straight line is

- a. curved.
- b. passing by the origin point.
- c. parallel to x-axis.
- d. parallel to y-axis.

35. When an object is placed to face a convex mirror, the image formed is

- a. lies behind the mirror.
- b. is real.
- c. is erect.
- d. (a) and (c).

36. The chemical structure of the chromosome is

- a. the nucleic acid only.
- b. protein and nucleic acid.
- c. protein, fats and nucleic acid.
- d. all the previous.

37. The universe contains

- a. galaxies & stars.
- b. planets
- c. living organisms.
- d. all the previous

38. Within minutes of the Big Bang, the percentage of hydrogen in the universe was

- a. 25%
- b. 50%
- c. 75%
- d. 100%

39. The distance and displacement are equal when the body moves in apath in one direction.

- a. zigzag
- b. circular
- c. straight line
- d. curved

40. The two factors in which the movement of an object can be described

- a. speed and time.
- b. distance and time.
- c. area and time.
- d. speed and acceleration

41. Property of the image of the object formed by the plane mirror always be

- a. inverted.
- b. equal to the object.
- c. smaller than the object.
- d. a and b

42. Scientists believe that the universe emerged from massive explosion and it is in.....

- a. continues contraction.
- b. contraction then expansion.
- c. expansion then contraction.
- d. continues expansion.

43. If a light ray falls passing through the optical centre of the convex lens, it leaves the lens

- a. passing through the focus.
- b. parallel to the principal axis.
- c. without refraction.
- d. reflects

44. The result of multiplication speed of a moving object by time

- a. acceleration
- b. velocity
- c. distance.
- d. force.

45. The value of change of an object speed is called

- a. speed.
- b. displacement
- c. acceleration.
- d. velocity.

46. If diameter of concave mirror 20 cm, then the focal length equalscm

- a. 5
- b. 10
- c. 40
- d. 20

47. began to form after 3000 million years after the Big Bang.

- a. ancestral galaxies.
- b. the sun.
- c. galaxies
- d. the earth.

48. The source of genetic variation is the reproduction.

- a. budding
- b. vegetative.
- c. sexual.
- d. asexual

49. The image formed by using a concave lens is

- a. real, enlarged, and inverted. b. virtual, smaller and inverted.
c. virtual, diminished and upright. d. real, inverted and diminished.

50. When an object with 6 cm length is put in front of a convex reflecting surface, and at a distance from it equals to its radius of curvature, then the length of the formed image iscm

- a. 8 b. 4 c. 6 d. 10

51. Milky way galaxy took its disc form after about million years after Big Bang.

- a. 5000 b. 3000 c. 1000 d. 10000

52. The optical piece which forms an image that inverted and equal to the object is

- a. concave lens. b. concave mirror.
c. convex mirror. d. plane mirror.

53. The nucleolus disappears during the mitosis division in

- a. prophase. b. metaphase. c. anaphase. d. telophase.

54. (Distance - time) graph for an object moves at regular speed is represented by a straight line

- a. parallel to time axis. b. parallel to distance axis
c. passing through the origin point. d. (a) and (c) together.

55. A convex lens with 20 cm focal length, object placed at 30 cm from the lens so image is formed atcm

- a. 10 b. 20 c. 40 d. 50

56. If you know the focal length of a concave mirror is 10 cm ,to get a virtual image the object is placed at distancecm

- a. 5 b. 10 c. 15 d. 20

57. The two gases which produced galaxies, stars and universe are with 3:1 ratio are.....

- a. oxygen & helium. b. helium & hydrogen.
c. oxygen & carbon dioxide. d. hydrogen & helium

58. When the reflected light ray is perpendicular to the incident light ray, then the angle of incidence is equal to.....

- a. zero b.90 c. 60 d.45

59. A spherical mirror forms a real image its length (5 cm) for an object of length (15 cm), placed at a distance of 20 cm from it. So the probable focal length of this mirror is..... Cm

- a. 5 b. 10 c. 20 d. 30

60. When a light ray fall is perpendicular to the reflecting surface, then the angle of incidence is equal to.....

- a. zero b.90 c. 60 d.45

61. An object is placed in front of an optical piece, and its image is formed exactly at the position of the object, so the used optical piece is.....

- a. concave lens. b. concave mirror.
c. convex mirror. d. plane mirror.

Question 2

Write the scientific term of each of the following

1. The distance moved through a unit time.
2. Asexual reproduction takes place in some plants without need to seed
3. A group of stars rotates together in cosmic space

4. The combination of the male gamete and female gamete to form a zygote.
5. The space which contains all the galaxies, stars, planets and living organisms.
6. It is the speed by which the object moves when it cover equal distances at equal periods of time.
7. An optical piece is thin at its center and thicker at the center and diverging light rays falling on it.
8. The angle between the reflected light ray and the normal line at the point of incidence surface.
9. Cell produced due to fusion of the male gamete to form the zygote.
10. The speed of an object relative to an observer.
11. The force that controls the orbits of the planets around the Sun modern theory.
12. Specialized cells which produce gametes.
13. changing the position of an object as the time passes according to a fixed point.
14. A point inside the lens that lies on the principal axis at mid distance between the faces of the lens.
15. Organ in fungus that carry a large number of spores till maturity
16. A medical case as a result of the formation of the image behind the retina.
17. The total distance that a moving object covers divided by total time taken to cover this distance.
18. The object's speed changes by equal values through equal periods of times.
19. A mirror, always forms a diminished image.
20. A distance in a given direction.
21. A biological process, where the living organism produces new individuals of the same kind and thus, ensuring its continuity.

22. A structure emerged as a lateral bulge in the parent cell where one of the two nuclei formed by mitosis migrate to it
23. It is located in one of the spiral arms of the Milky Way galaxy on the edge of the galaxy.
24. The object's speed increases by equal values through equal periods of times.
25. A flat gaseous round disk that formed the solar system.
26. The unit which is used for distance between celestial bodies.
27. The nucleic acid that carries the genetic traits of organism.
28. The displacement in one second.
29. It is a thin plastic lenses can stick to the eye cornea
30. Responsible for formation spindle fiber in plant cell
31. The distance between the pole of a spherical mirror and its center
32. The mirror, whose reflecting surface is a part of the inner surface the sphere.
33. Ability of some animal to compensate its missing parts
34. The point of connection between two chromatids in a chromosome
35. It's a theory which explain the origin of universe from massive explosion
36. A type of asexual reproduction occurs in simple algae and bacteria
37. The straight line that passes by center of curvature of the mirror and its pole.
38. It's a mirror that its reflecting surface is a part of a hallow sphere.
39. The mass of cells which result from uncontrolled division of some abnormal cells
40. The mid-point on the reflecting surface of the mirror.
41. A phase in which some important process occurs to prepare the cell for division and of genetic material duplicates
42. A disease that infects the eye lens and it becomes opaque.
43. A part in the cell responsible for cell division

44. A vector quantity that equals the displacement in one second.
45. A theory assumed that the solar system was originally a big star which is the Sun.
46. An optical device used to follow up the battle in war
47. A cell division that occurs in the somatic cells and results in the growth of the living organism.
48. Chemically consists of DNA and protein.
49. The actual length of the path that a moving object takes from the starting point of movement to the end point.
50. A type of sexual reproduction occurs in protozoa
51. Fibers extend between the two poles of the cell in prophase.
52. The image that cannot be received on the screen.
53. The line that joins between the two centers of curvature of the lens passing by the optical centre of the lens.
54. Cells are not divided as they don't contain centrosome
55. Cells are not divided as they don't contain nucleus
56. The distance covered through a unit time.
57. The physical quantity that has magnitude only and has no direction.
58. A mirror can be used to get virtual, upright and magnified image of an object.
59. A pair of connected thread.
60. A pair of chromosomes
61. Angle of incidence of the light ray equals its angle of reflection.
62. A mirror used to form virtual, upright and diminished image.
63. It is the point of collection of the refracted light rays or their extensions which are produced, when the light rays fall parallel to the principal axis of a lens.
64. Any straight line that passes by the centre of curvature of the mirror and any point on its surface except the pole of the mirror

65. The exchange of some parts of the two inner chromatids of each tetrad group.
66. the object whose position doesn't change as the time passes.
67. A type of reproduction that depends on only one parent.
68. The change of displacement relative to time.
69. Cells which are produced by meiosis and contain half the number of chromosomes in the parent cell.
70. Seeing the far objects clearly but the near objects are not seen clearly.
71. A dangerous disease occurs when some of the body cells are divided continuously without controlling.
72. Special equipment used to study the Sun through its spectrum.
73. Mathematical methods that physicists use to predict the relation between certain physical quantities.
74. An optical piece that is used to magnify the parts of watch when examining it.
75. The result of multiplying double the speed by half the time
76. Seeing the near objects clearly and seeing the far objects distorted.

Question 3

Complete the following sentences:

1. The Sun and the surrounding planets revolve around the center of galaxy.
2. Mitosis occurs in the cells of living organisms.
3. Distance is a physical quantity, while force is a physical quantity.
4. The scientist who established the modern theory about the evolution of the solar system is
5. The short-sighted person needs glasses of
6. Vegetative reproduction in plants happens by division

7. vision defect which is due to the decrease in the eyeball diameter is calledand is corrected by lenses.
8. The two factors which can be used to describe the motion of a body are theand
9. The Big Bang theory explain the origin of....., while the nebular theory explains the origin of
10. In animal cell spindle fibers formed from, while in plant cell spindle form at the poles.
11. The galaxy that solar system belongs to is called
12. The image formed by concave lens is always,and erect.
13. The nucleolus and nuclear membrane disappear at the end of of mitosis.
14. The change of an object position as time passes according to another fixed object is called
15. Condensing the cytoplasm in the two poles of the plant cells forms
16. Crossing over phenomenon happens between the during the In meiosis division.
17. In human and animals, meiosis occurs in to produce the male gametes, while it occurs in..... to produce the female gametes.
18. The convex lens the light, while convex mirror the light
19. Speed measuring unit is, while the measuring unit of acceleration is
20. The crossing over phenomenon occurs in of.....division .
21. and are types of spherical mirrors.
22. The moving car with 50 Km/h in constant direction its speed appear to120 km/h related to observer moves with Km/h in..... direction.
23. A concave mirror has a focal length 20 cm the radius of curvature of its spherical surface equals

24. Correcting long-sightedness lens and correcting short-sightedness by using lenses .
25. Hydra reproduce by , while the amoeba reproduces by
26. image can be received on a screen.
27. We use lens to obtain a virtual and magnified image.
28. The straight distance covered by the object in a certain direction is called
29. The telescope is from the space telescopes collect photos for universe
30. The spindle fibers are formed during the cell division in
31. The double of the distance between the optical center of a lens and its focus=
32. reproduction doesn't require neither special systems nor structures in the living organisms.
33. are used instead of medical glasses to treat vision defects.
34. When the object is placed at of the convex lenses, there is no image formed.
35. The object's path may be ... , or a combination of both.
36. The velocity is the in one second.
37. The (speed - time) graph of motion at uniform speed is represented by a line
38. vision defect which is due to a shortness in the radius of the eyeball is called
39. The sun takes about years to complete one rotation around
40. Sexual reproduction in higher living organisms depends on two basic processes which areand
41. An object moves by regular speed when is equal to
42. A real image cannot be formed by a..... lens and..... mirrors and amirror.

43. In flowering plants, meiosis division occurs into form..... (as a male gamete).
44. The two gases which produced galaxies, stars through millions of years areand.....
45. If the body moves from rest, so its initial speed equals
46. is the change of an object's position as time passes according of another object.
47. Mustafa El Said discovered a way to detect the cancer cell by using.....
48. From the examples of the multicellular organisms reproduced by budding is
49. The cell contains the genetic material of the living organism which consists of a number of
50. When the object lies in front of lens, a virtual and diminished image is formed.
51. The yeast fungus reproduces by, while the starfish reproduces by
52. The relative speed of an object moving faster than the observer which moving in the same direction is equal to

Question 4

Put (✓) or (X) and correct the wrong sentences:

1. The contact lenses are used instead of glasses by putting it on the eye retina.
2. During meiotic division, gametes are produced by special cells known as somatic cells
3. By putting a source of light in front of a convex lens, the reflected rays are converged.
4. The universe emerged when atomic particles merged together producing helium and hydrogen gases.

5. The graphical relation (distance - time) for uniform motion at a constant speed represented by a straight line parallel to the time axis.
6. A train covers 200 km during 100 minutes, so its speed = 2 km/h.
7. Algae can reproduce by regeneration.
8. The stars explosion phenomenon is resulted from sudden chemical reaction.
9. It is said that the object that moves at a constant speed moves at uniform acceleration.
10. The scientist who established the Crossing Star theory is Fred Hoyle.
11. The speed of the car can be identified directly by using the compass.
12. According to the Crossing Star theory, planets of the solar system were originated from the explosion of a star rotate near the Sun.
13. Displacement and velocity of an object are similar in direction and different in measuring unit.
14. Mitotic cell division produces two cells each one contains half number of chromosomes of parent cell.
15. The speed of the car can be identified directly by using the speedometer.
16. The offspring resulted from sexual reproduction keeps the genetic structure of the living organisms.
17. The long-sightedness is corrected by using a convex mirror.
18. If the number of chromosomes in pollen grain in a plant is 16 chromosomes, then the number of chromosomes in stem cells of the same plant is 16 pair chromosomes.
19. When the object position changes as time passes, the object is moved during this period.
20. The bud emerges as a lateral bulge in the cell, the cell nucleus divides meiotically into two nuclei, one of them remains and the other migrates to the bud.

Question 5

Correct the underlined words:

1. The focal length of thick convex lens is equal to the focal length of the thin convex lens.
2. A lot of old stars gather in the spiral arms of Milky Way galaxy.
3. A light ray falls, where it makes an angle of (20°) with the reflecting surface of a plane mirror, so the ray reflects by an angle (20°) .
4. The building unit of the universe is the Sun.
5. The measurement unit of the quantity resulting from dividing the displacement by the time of an object is m/s^2 .
6. The universe was formed from the merging of atomic particles, forming the oxygen and nitrogen gases that produced the universe.
7. An equal image for an object is formed at a distance of 14 cm by a concave mirror its diameter is 7 cm.
8. Asexual reproduction occurs by meiotic cell division.
9. Each galaxy has a distinctive shape according to harmony and order of the groups of planets in it.
10. Pollination is the process during which male gamete fuses with female gamete forming zygote.
11. Object speed can be determined directly by using compass.
12. Velocity is the total distance covered by the moving object divided by the total time.
13. A sudden violent chemical reaction occurs within the star which led to its explosions.
14. Spores are formed in bread mould fungus inside special organs, which are called ovary.
15. Contact lenses can stick to the eye retina to correct the vision defects.
16. The lens is a transparent medium that reflects the light and it is limited with two spherical surfaces.

17. The position and the properties of the formed image by a concave mirror depend on the length of the object relative to the concave mirror.
18. When the light ray falls parallel on the reflecting surface, so the reflected ray will be perpendicular on the reflecting surface.
19. The Sun was born after 12000 million years of the Big Bang, and then the Earth and planets were created.
20. The ratio between the length of the object to the length of the image formed by a concave lens is equal to the whole one.
21. The crossing over phenomenon occurs in anaphase of first meiosis.
22. If two cars moving in the same direction at the same speed equal 120 m/sec., so the relative speed equal 60 m/sec.
23. The lion is considered one of the fastest wild animals.
24. The focal length of convex lens equals the distance between focus end pole of the lens
25. The Crossing Star theory is founded by scientist Fred Hoyle
26. The long-sightedness is corrected by using a convex mirror.
27. Reproduction by sporogony occurs in starfish.
28. Amoeba reproduces by budding.
29. A spherical mirror whose diameter is 40 cm, so its focal length equals 40 cm.
30. The formed image of an object that is put at the centre of curvature for a convex lens is virtual enlarged.
31. The spindle fibers are formed in the plant cell from the centrosome.
32. Chromosomes are arranged at the middle of the cell in the telophase.
33. Budding is artificial way for asexual reproduction in plants
34. Metaphase is adverse phase to prophase

Question 6

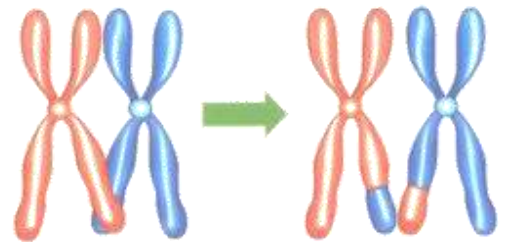
Find out the different word that does not fit the following statements:

1. Mass of an object 100 kg — Its length 16 cm — It covers 50 m — speed decreases by 120 m/s^2 .
2. The sun — The Milky Way Galaxy — Eight planets — Ten planets.
3. The Big Bang theory — Nebular theory — The Crossing star theory - The Modern theory.
4. Kilometer/hour — Meter/second — Meter/minute — Meter/second²
5. The mass - The velocity - The force - The acceleration of motion.
6. Ovary — Leaf — Root — Shoot.
7. Budding — Regeneration — Binary fission - Gametes — Spores.
8. Sponge — Yeast fungus — Starfish — Hydra.
9. meter/second — meter/minute — kilometer/hour — kilometer.
10. Reproduction by part of the stem — Reproduction by part of the root — Reproduction by seeds — Reproduction by tissue culture.
11. Moulton — Crossing Star theory — Chamberlain — Nebula.
12. Nebular theory-Big Bang theory-Modern theory-Crossing star theory
13. Reproductive cells — Liver cells - Gametes cells — Skin cells.
14. The properties of image in the concave lens are (Virtual — Magnified — Upright — Minimized).

Question 7

1) The opposite figure shows a vital phenomenon

1. What is the name of this phenomenon?
2. Mention the name of the phase in which phenomenon occurs and the type of division.
3. What is the importance of its occurrence?

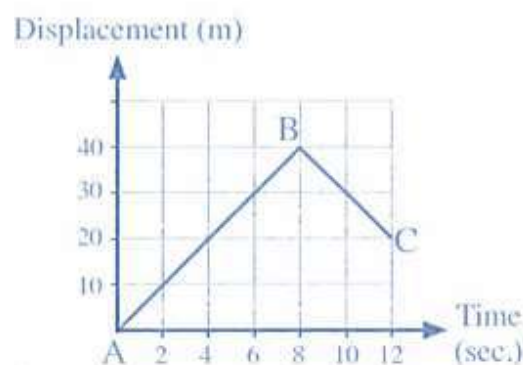


2) An object is placed at a distance of (9 cm) from a concave lens has a focal length (3 cm)

1. Draw the direction of the ray
2. Mention the properties of image formed.

3) In the opposite figure , that represents the movement of an object from point (A) to point (C) passing by point (B), Calculate the following :

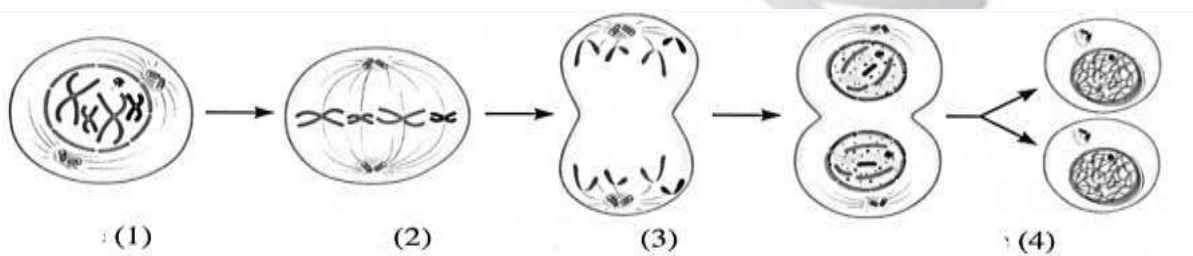
1. Speed.
2. Velocity.
3. The acceleration at AB



4) A car moved from Banha to Cairo 40 km in 30 minutes, then it returns back from Cairo to Banha in the calculate (in km/h):

1. The car velocity in whole trip
2. The average speed in whole trip

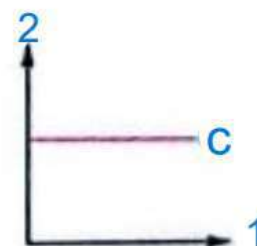
5) Look at the following figure, then answer the following:



1. What is the kind of cell division in this figure?
2. What is the name of phases number (2) and (3).
3. What will disappear in phase number (1)

6) In the opposite graph:

1. If the line (C) represents a moving body by acceleration equal zero, then what do the horizontal axis (1) and the vertical axis (2) represent?



7) A racer covered 50 meters northward in 40 seconds then 100 meters eastward in 60 seconds then 50 meters southward in 10 seconds, and then returns back to the start point in 40 seconds:

1. Calculate the total distance that the racer moved?
2. What is the average speed of the racer?
3. Calculate the displacement?

8) Write the number which indicates (refers to) each of the following:

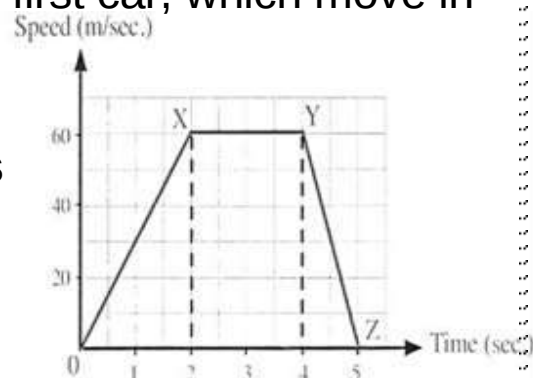
- 1)** Distance between plane mirror and optical centre of lens if an object was put in the mid-distance between plane mirror and optical centre of (converge) convex lens its focal length equal (6 cm) the image formed by plane mirror at distance equal (12 cm).
- 2)** The number of produced cells from the mitosis (mitotic) division of a somatic cell once.
- 3)** The number of gametes resulting from a meiosis division of a reproductive cell in the testes.
- 4)** The length of image which is formed to an object its length 5 cm at a distance of 4 cm from a convex lens, its focal length is 2 cm.
- 5)** The number of cells produced by an amoeba cell divides three successive mitotic divisions.
- 6)** The number of chromosomes in a fertilized ovum of an animal if the number of chromosomes in a sperm is 20 chromosomes.
- 7)** The focal length of a concave mirror if the distance between its center and pole is 4 cm
- 8)** The speed of a body that covers a distance of 36 meters in 6 seconds.
- 9) A train moves in a straight line with speed of 40 m/sec. and its speed decrease by 2 m/se for each second if the break applied find the time taken to stop the train**

10) Two cars, the first car moves at a speed of 80km/h while the second car moves at a speed of 120 km/h. Calculate:

1. The relative speed of the first car relative to observer on one side of road.
2. The relative speed of the second car relative to first car, which move in the same direction

11) From the opposite graph which represents the motion of a car

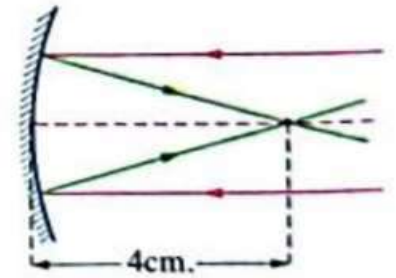
1. value of the maximum speed of the car equals m/s.
2. The kind of acceleration in part (yz) is



12) Calculate the actual speed of the car whose relative speed is 80 km/h relative to an observer moving in opposite direction at a speed of 30 km/h

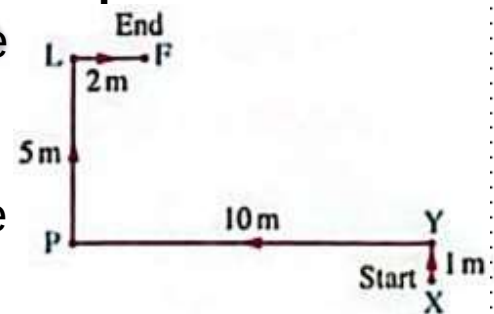
13) By using the data shown in the following figure:

1. Draw on your answer sheet the path of the rays for an object when it is placed at a distance of (11 cm) from this mirror to form the image.
2. Mention the properties of the formed image in this case?



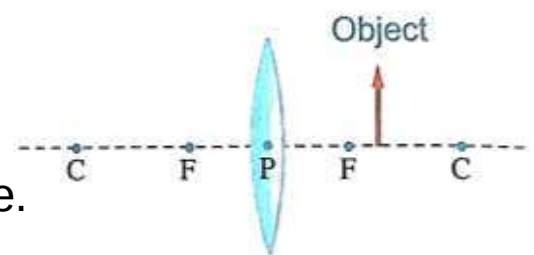
14) The opposite figure shows the path of movement for two persons from the same starting point to the end point. Find:

1. The time of motion of the first person to take the path from (X) to (F) passing through the points (Y, P & L) with a speed of 6 m/s.
2. The time of motion of the second person to take the path (X) to (F) directly with a speed of 4 m/s.



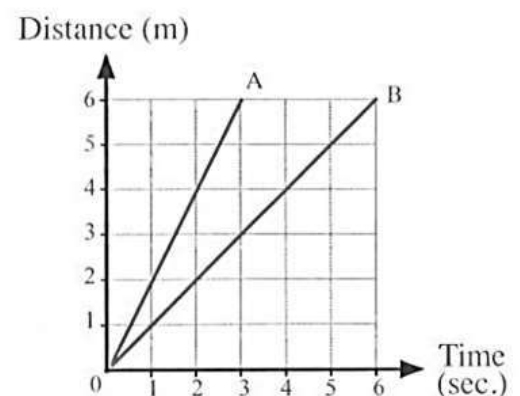
15) In the opposite figure:

1. Complete the path of the rays to form an image for the object.
2. Mention the properties of the formed image.



16) The opposite graph represents the (distance - time) graph for the movement of two objects A , B From the graph, answer the following :

1. What is the kind of speed of the two objects?
2. Calculate the ratio between the speed of object A and the speed of object B



17) A car moves at a uniform speed covers 80 m in 4 sec. then the driver presses the brakes, so it stopped after another 4 sec. Find:

- (a) The magnitude of the acceleration within the first 80 m.
- (b) The magnitude of the acceleration after pressing the brakes.

18) An object is placed at a distance of 6 cm from a convex lens its focal length is 3 cm.

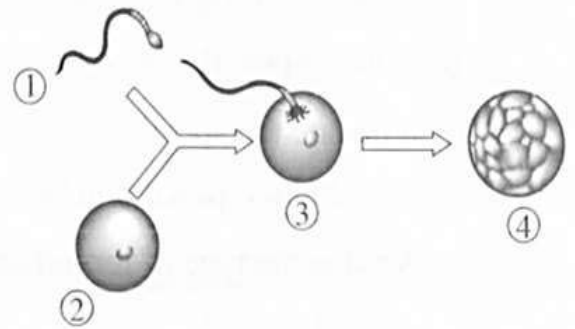
Show by drawing the position of the formed image and mention the properties of this image, by drawing two light rays only.

19) The opposite figure resents one of the important process to complete the reproduction. Answer the following:

a. What is the name of the process that number 1 refers to? And what is the name of the produced cell?

b. What is the type of cell division through which number 2 is produced, and that occurs to number 4?

c. Write the symbol which represents the number of chromosomes in the cells 1, 2 and 3.?



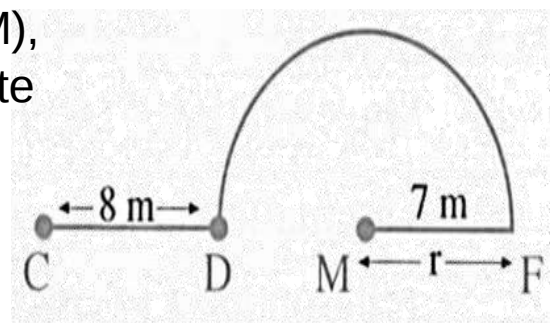
20) When each of the following values equal Zero:

- 1. Reflecting angle of a light ray incident on a plane mirror.
- 2. Reflecting angle for an incident ray fall on a concave mirror.
- 3. The velocity of a moving object

21) In the opposite figure:

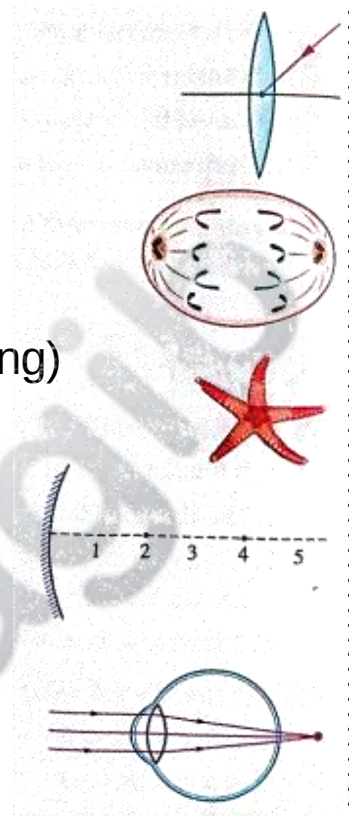
An object is moving from point (C) to point (M), passing by two points (D, F) in 5 sec, Calculate

- (a) The covered distance
- (b) The velocity



22) Study the following figures, then answer:

1. The incident ray pass as straight line in this figure (true or false).
2. Mention the main important changes that takes place in the phase that precedes this phase.
3. In this organism the asexual reproduction by (spore propagation – regeneration - binary fission - budding) choose the correct answer.
4. In which position the object (1) must place to form a virtual erect enlarged image, knowing that point (2) represents a real focus and point (4) represents centre of curvature of a concave mirror.
5. The opposite figure represents one of vision defects:
 - a. Mention the name of this vision defect.
 - b. How this vision defect treated?

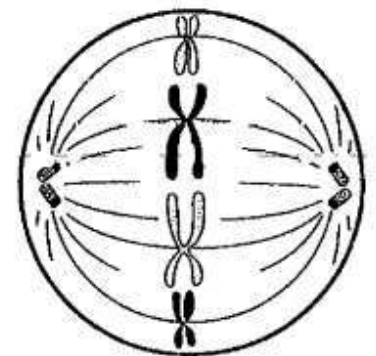


23) Determine the position of an object in front of a concave mirror if the formed image is

1. Real, inverted and magnified.
2. Virtual, erect and magnified.
3. Real, inverted and minimized.

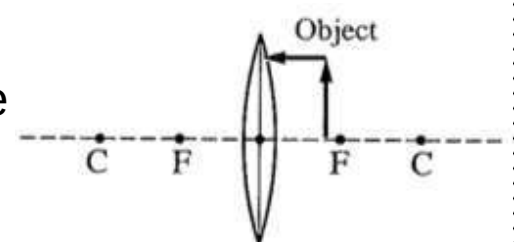
24) Through your study the stages of mitotic division answer the following:

1. Name the phase that preceding this phase the figure.
2. In which phase the centromere of each chromosome is split lengthwise into two halves?
3. In which phase the spindle fibers disappear?
4. What the importance of interphase?

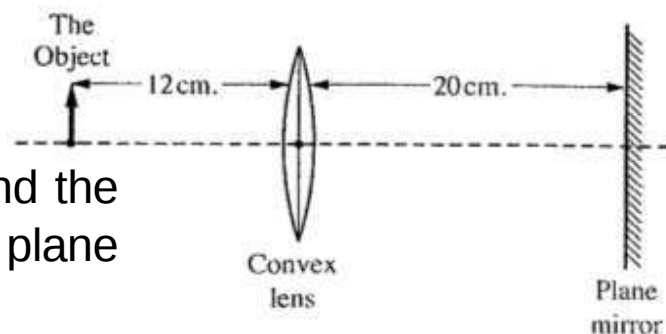


25) In the opposite figure:

1. Complete the path of the rays to form an image for the object.
2. Mention the properties of the formed image.



26) In the figure convex lens formed an image for the object at its left side at a distance of (12 cm), and this image is (real - inverted - equal to the object) in front of a reflecting surface of a plane mirror a way of the lens (20 cm).



Conclude each of the following:

1. Focal length of the convex lens.
2. The distance between the object and the image formed for new image by the plane mirror?
3. Is the image upright or inverted for the object?

27) Mention the properties of the formed image in each of the following cases :

1. An object is placed in front of a convex mirror at the center of curvature.
2. An object is placed in front of a convex lens at a distance less than its focal length.
3. An object placed at the focus of a convex lens.
4. A very far object Infront of concave mirror

28) A car speeds up from 0 m/s to 10 m/s in 4 seconds, then it slows down to 5 m/s in 2 seconds. Calculate:

1. The acceleration of the moving car in the first stage and the acceleration of the moving car in the second stage.
2. The time taken by the car in the second stage to stop if it moves at the same rate of velocity change.

Question 8

Give reason:

1. No image is formed when the object is placed at the focus of a convex lens,

Because the refracted rays from a lens don't meet and pass through a parallel way at infinity

2. The motion of a train (or metro) can be considered as a motion in one direction.

Because the train moves forward or backward in a straight path or curved path or combination of both

3. Cars and planes are provided with speedometers.

To help us in identifying the speed of cars and planes directly.

4. the number of chromosomes is constant in the same kind reproduce sexually.

Due to meiosis division (which reduce the number of chromosome) in gamete then the combination of male gamete (N) and female gamete (N) to form a zygote which contains the whole number (diploid number) of chromosomes (2N)

5. The object speed increases by decreasing the time needed to cover a certain distance.

Because speed is inversely proportional to the time. $V = d/t$

6. The uniform speed of a car cannot be obtained practically.

Because car speed changes according to the conditions of the road.

7. (Distance- Time) graph of an object that moves at a uniform speed is a straight line passing through the origin point.

Because the distance is directly promotional to the time when the object moves at a constant speed.

8. When the driver of a moving car uses the brakes, we describe the car movement as a decelerating motion.

Because the car speed decreases as time passes.

9. The body which moves at acceleration can't move at a regular speed

Because its speed changes by passing time.

10. The acceleration is positive when its value increases, while it is negative When its value decreases.

Because when moving with a positive acceleration, the final speed is greater than initial speed, while when moving with a negative acceleration the final speed is less than the initial speed.

11. Velocity and force are considered vector physical

Because they have magnitude and direction.

12. When an object moves, where its starting point is the ending point, its velocity equals zero.

Because the displacement of this object is zero.

13. The amount of consumed fuel by a plane flies between two cities is differ according to the wind direction.

Because when the plane flies against the wind direction, its velocity decreases and it consumes more fuel and takes more time than that it flies in the same direction of the wind direction.

14. Pilots take in consideration the velocity of the wind during their flights.

Because the direction of the wind affects the velocity of the plane and hence the time of the trip and the amount of the fuel consumed.

15. The short-sightedness is corrected by using a concave lens.

Because the concave lens diverges the rays coming from a far object, so the image is formed on the retina

16. Cellular division begins with interphase before starting mitosis division.

To prepare the cell for division through some important biological processes here the amount of genetic material duplicates.

17. the lens had two centers of curvature

Because they have two circular surfaces, each surface has a center.

18. Binary fission is considered a mitotic division.

Because two identical cells are produced, each one is identical to the parent cell (asexual reproduction)

19. Crossing over phenomenon is an important factor in genetic variation among individuals of the same species.

Because it contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them randomly in the gametes

20. We say that the train moves with an irregular speed.

Because it covers unequal distances at equal periods of time or it covers equal distances at unequal periods of time.

21. The moving car seems stable to an observer moves at the same speed and the same direction.

Because the relative speed equals the difference between their speeds equals zero.

22. Physicists use mathematical relations like graphs and tables in many physical phenomena.

In order to:

- predict the relation between certain physical quantities.
- understand practical results.
- describe physical phenomena in an easier way.

23. Meiotic division is called by reduction division.

Because the produced cells contain half the number of chromosomes of the original cell.

24. The image formed by a plane mirror cannot be received on the screen
Because it is a virtual image.

25. When you look at the mirror you see your face image.
Due to light reflection.

26. The perpendicular incident light ray on plane mirror reflects on itself.
Because the angle of incident equal the angle of reflection equals zero.

27. Cataract disease infects the eye.

Due to: age - illness - side effects of drugs - genetic readiness.

28. Sexual reproduction is a source of genetic variation.

Due to the occurrence of the crossing over phenomenon during it and the genetic materials come from two source male and female

29. There are no new races of grapes, when they reproduce by vegetative reproduction.

Because vegetative reproduction depends on mitotic division, in which the produced cells contain a full copy of the genetic material of the parent cells.

30. The constancy of the planets in their orbits around the Sun.

Due to the gravity of the sun

31. Distance is a scalar physical quantity.

Because they have magnitude only and have no direction

32. The continuous expansion of space.

Due to the movement of galaxies apart

33. Mitosis division is more important than meiosis for children

Because mitosis division help in growth and compensate damaged cell which the body of children needs, while meiosis division aims to the production of gametes in adults only.

34. The Sun escaped from the gravity of the huge star in the crossing star theory.

Due to the explosion in the expanded part of the Sun that faces the huge star

35. The number of chromosomes is constant in the same species which reproduce sexually.

due to meiosis division (which reduce the number of chromosomes) in gametes, then the combination of male gamete (N) and female gamete (N) to form a zygote which contains the whole number (diploid number) of chromosomes (2N).

36. In short-sightedness, the retina is far from the eye lens.

Due to the increase in the eyeball diameter.

37. Shrinkage of spindle files during the anaphase

To form two identical groups of chromosomes at each pole of the cell.

38. focal length of a concave mirror can be determined by knowing its radius of curvature.

Because focal length (f) = $1/2 \times$ radius of curvature (r)

39. The image formed by the convex mirror is always virtual.

Because it is formed behind the mirror from the intersection of the extensions of the reflected light rays and it cannot be received on a screen.

40. The word "AMBULANCE" is written laterally inverted way on the ambulance car.

Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and so it appears laterally corrected to the drivers.

Question 8

What happen if:

1. the gravity between the Sun and planets, is vanished

the planets will leave their orbits and float in a random fashion in space and there will be no solar system.

2. A light ray passes through the optical center of the lens.

It passes through the lens without refraction

3. Putting a yeast fungus in a warm sugary solution.

The yeast fungus reproduces asexually by budding forming a new fungus separated remains connected to the parent cell forming a colony.

4. The nebula gradually lost its heat (from point of view of Laplace scientist).

Its size contracted and its revolving speed around itself increase

5. Absence of centrosome in the animal cell.

The spindle fibers are not formed therefore the cell division doesn't completed.

6. A light ray is incident passing through the optical center of a convex lens.

It passes through the lens without refraction

7. To the displacement of a moving body when it returns its starting point.

The displacement equal zero

8. To the speed of a body if it covers the same distance in half the time.

It will increase to double

- 9. Reproductive cells are divided by meiosis.**
They will produce the gametes that contain the half number of chromosomes.
- 10. When rupturing sporangium in bread mould fungus.**
A large number of spores are released and when find suitable environment it grow by mitotic division giving new fungus
- 11. To the distance between the image and the plane mirror when the body becomes closer to the mirror.**
The image will move close to the mirror
- 12. The initial speed of a moving body is greater than the final speed.**
The body speed decreases by passing time and the movement is described as a decelerating motion.
- 13. The combination of the male gamete and female gamete.**
A zygote is produced which when it grows, it gives a new offspring with traits of its parents
- 14. Reflection of a light ray falls on a concave mirror to pass with its focus.**
It will reflection parallel to principle axis
- 15. A body is placed at a distance less than the focal length of a concave mirror.**
A virtual, erect and magnified image is formed behind the mirror
- 16. The shortness of the diameter of the eyeball.**
This causes the shortness of the radius of the eye, thus the retina is close to the eye lens and this causes long-sightedness
- 17. If the starfish loses one of its arms containing a part of its central disc**
This part grows forming a new individual ang the original organism compensates its missing arm
- 18. If the incident light ray falls parallel to the principal axis of concave mirror.**
It reflects passing through the focus.
- 19. Focusing laser on the gold Nano-particles in the cells infected by cancer.**
the nano-molecules of gold which stuck the surface of cancerous cell absorb the light o heat which leads to burn and kill the infected cell.
- 20. A light ray is incident passing through the center of curvature of a concave mirror.**
It reflects on itself
- 21. The parts of the inner chromatids are exchanged in the first prophase.**
Crossing over phenomenon occurs.

22. An object is put at the focus of a convex lens.

No image is formed.

23. The liver gets injured or a part of it is cut.

The remaining cells undergo many mitotic divisions to compensate the missing part

24. 23.The starfish misses one of its arms and it contains a part of its central disk.

The starfish compensates its lost arm and the arm forms new individual if it contains a part of the central disc.

25. The centrosome disappears from the animal cell .

The spindle fibers are not formed so the cell division doesn't completed.

Answers

Question 1

1. a	2. b	3. b	4.b	5.c	6.b	7.b	8.c	9.c	10.a
11. d	12. d	13. a	14.c	15.b	16.c	17.b	18.c	19.b	20.d
21. d	22. b	23. b	24.c	25.d	26.d	27.c	28.a	29.c	30.b
31. c	32. d	33. c	34.c	35.c	36.b	37.d	38.c	39.c	40.b
41. b	42. d	43. c	44.c	45.c	46.a	47.c	48.c	49.c	50.c
51. a	52. b	53. a	54.c	55.d	56.a	57.d	58.d	59.a	60.a
61. b									

Question 2 Write the scientific term of each of the following

- | | | |
|----------------------------|--------------------------------|------------------------------|
| 1. Speed | 28. Velocity | 54. Neural cell |
| 2. Vegetative reproduction | 29. Contact lens | 55. Adult red blood cell |
| 3. Galaxy | 30. Condensed cytoplasm | 56. Speed |
| 4. Fertilization | 31. Radius of mirror curvature | 57. Scalar physical quantity |
| 5. The universe | 32. Concave mirror | 58. Concave mirror |
| 6. Regular speed | 33. Regeneration | 59. Chromosome |
| 7. Concave lens | 34. Centromere | 60. tetrad |
| 8. Angle of reflection | 35. Big bang theory | 61. First law of reflection |
| 9. Zygote | 36. Binary fission | 62. Convex mirror |
| 10. Relative speed | 37. Principle axis of mirror | 63. Focus of lens |
| 11. Attraction force | 38. Spherical mirror | 64. Secondary axis of mirror |
| 12. Reproductive cell | 39. Tumor | 65. Crossing over phenomenon |
| 13. Motion | 40. The pole of mirror | 66. Static object |
| 14. Optical centre | 41. Interphase | 67. Asexual reproduction |
| 15. The sporangium | 42. Cataract | 68. Velocity |
| 16. Long sightedness | 43. Nucleus | 69. Gametes |
| 17. Average speed | 44. Velocity | 70. Long sightedness |
| 18. Uniform acceleration | 45. Crossing star theory | 71. Cancer |
| 19. Convex mirror | 46. Binocular | 72. Solar telescope |
| 20. Displacement | 47. Mitosis cell division | 73. Table and graphs |
| 21. Reproduction | 48. Chromosome | 74. Magnifier lens |
| 22. The bud | 49. Distance | 75. Distance |
| 23. Solar system | 50. Binary fission | 76. Short sightedness |
| 24. Positive acceleration | 51. Spindle fibers | |
| 25. Nebula | 52. Virtual image | |
| 26. Light year | 53. Principle axis of lens | |
| 27. DNA | | |

Question 3 Complete the following sentences:

1. milky way
2. somatic cell
3. scalar – vector
4. Alfred Hoyal
5. concave lens
6. Mitotic division
7. Long sightedness – convex lens
8. Distance – time
9. Universe – solar system
10. Centrosome – condensed cytoplasm
11. Milky way galaxy
12. Virtual- diminished
13. Prophase
14. Motion
15. Spindle fibers
16. Two inner chromatid of tetrad -prophase I
17. Testes-ovary
18. Collect – diverge
19. m/sec - m/sec².
20. Prophase I – meiosis
21. Concave mirror -convex mirror
22. 70 - Opposite
23. 40 cm
24. Convex – concave
25. Budding – binary fission
26. Real
27. Convex
28. Displacement
29. Hubble
30. Prophase
31. Radius
32. Asexual
33. Contact lenses
34. Focus
35. Straight -curved
36. The displacement
37. Straight – parallel to time axis
38. Long sightedness
39. 220 million
40. Gamete formation- fertilization
41. Average speed – speed at any interval
42. Concave -convex -plane
43. Anther – pollen grain
44. Hydrogen – helium
45. Zero
46. Motion
47. Nano molecule of gold
48. Hydra -sponge
49. Nucleus – chromosome
50. Concave
51. Budding–reproduction by regeneration
52. Difference of their speed

Question 4

Put (✓) or (X) and correct the wrong sentences:

- | | | |
|------------------------|------------------------|-------------------|
| 1. X cornea | 8. X nuclear | 15. ✓ |
| 2. X reproductive cell | 9. X zero acceleration | 16. X asexual |
| 3. X refracted | 10. X modern theory | 17. X lens |
| 4. ✓ | 11. X speedometer | 18. ✓ |
| 5. X (speed-time) | 12. X modern theory | 19. ✓ |
| 6. X 12 km/h | 13. ✓ | 20. X mitotically |
| 7. X starfish | 14. X complete number | |

Question 5

Correct the underlined words:

- | | | |
|------------------------|--------------------|-------------------------------------|
| 1. shorter | 13. Nuclear | 25. Chamberlain and Moulton |
| 2. center | 14. Sporangium | 26. Convex lens |
| 3. 70 | 15. Cornea | 27. Mushroom fungus |
| 4. Galaxy | 16. Refracts | 28. Binary fission |
| 5. m/s | 17. Position | 29. 10 |
| 6. hydrogen and helium | 18. Perpendicular | 30. Distance less than focal length |
| 7. 28 | 19. 10000 | 31. Condensed cytoplasm |
| 8. Mitotic | 20. More than | 32. Metaphase |
| 9. Stars | 21. Prophase I | 33. Tissue culture |
| 10. Fertilization | 22. Zero | 34. telophase |
| 11. Speedometer | 23. Cheetah | |
| 12. Average speed | 24. Optical center | |

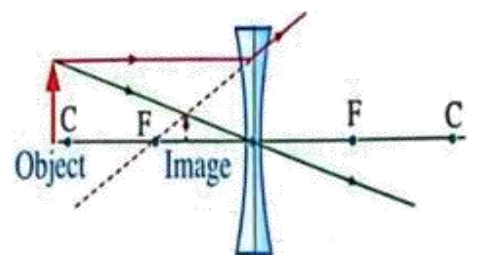
Question 6

Find out the different word that does not fit the following statements:

- | | | |
|--|---------------------------|---------------------|
| 1. speed decreases by 120 m/s ² | 6. Ovary | 12. Big Bang theory |
| 2. Ten planets | 7. Gametes | 13. Gametes cells |
| 3. The Big Bang theory | 8. Starfish | 14. Magnified |
| 4. Meter/second ² | 9. Kilometer | |
| 5. The mass | 10. Reproduction by seeds | |
| | 11. Nebula | |

Question 7

- crossing over phenomenon
- prophase I meiotic cell division
- It works on the variation of genetic traits among the members of the same species, where it contributes in the exchange of genes between the two homologous chromosome's chromatids and distributing them randomly in the gametes.
- Virtual, upright and diminished
- Distance = AB + BC = 60 m
Speed = $d/t = 60/12 = 5 \text{ m/s}$
 - velocity = displacement / time



= $20/12 = 1.67$ m/s in AC direction

3. $a = \text{zero}$

4. 1. Displacement = zero total time = $30 + 30 = 60\text{min} = 1\text{ h}$

Velocity = displacement / time = zero

Average speed = total distance / total time = $(40+40)/1 = 80$ km/h

5. 1. Mitosis cell division 2. Metaphase – anaphase

3. Nucleolus and nuclear membrane disappear.

Chromatin reticulum condenses then appears in the form of chromosomes

6. 1. time axis 2. speed

7. 1. Distance = $50+100+50+100 = 300$ m

2. Average speed = total distance / total time = $300 / (40+60+10+40) = 2\text{m/sec}$

3. displacement = zero

8. 1. $12+12 = 24$ cm 2. 2 cells 3. 4 gametes 4. 5 cm

5. 8 cell 6. 40 chromosome 7. 2cm 8. 6m/sec

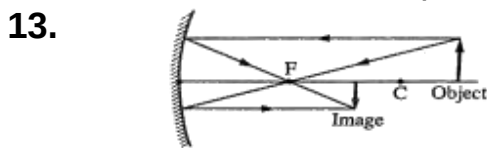
9. $t = (v_2 - v_1) / a = (0 - 40) / -2$

$t = 20$ sec

10. 1. 80 m/s 2. Relative speed = $v - v = 120 - 80 = 40\text{m/sec.}$

11. 1. 60 2. Negative acceleration

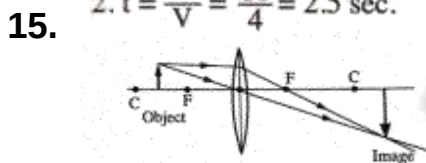
12. $80 = \text{real} - 30$ real speed = 50 m/se



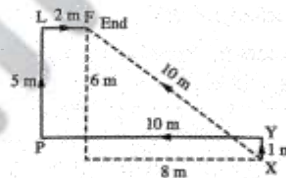
Real – inverted and smaller than the object.

14. 1. $t = \frac{d}{V} = \frac{1+10+5+2}{6} = 3$ sec.

2. $t = \frac{d}{V} = \frac{10}{4} = 2.5$ sec.



Properties : Real – invert and magnified.



16. 1. Regular speed

2. $V(A) = 6/3 = 2$ m/s $V(B) = 6/6 = 1$ m/s

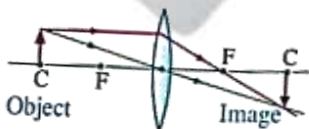
ration between speed A: speed B is 2:1

17. a. acc= zero as the car move with uniform speed

b. $V_1 = 80/4 = 20$ m/s $V_2 = \text{zero}$ $t = 4$ sec

$a = (V_2 - V_1) / t = (0 - 20) / 4 = -5\text{m/se}^2$

18. Real, inverted and equal in size



19. a. Fertilization process - Zygote.

b. Number (2) : Meiotic division

Number (4): Mitotic division.

c. (1) and (2): N (3): 2N

20. 1. When the incident light ray falls perpendicular on the reflecting surface, Incident angle = Reflecting angle = zero.
2. When the incident light ray falls passing through the centre of a concave mirror, Incident angle = Reflecting angle = zero
3. When the moving object returns back to the same starting point, The displacement = zero, and so velocity = zero.

21. a. distance from D to F = $\frac{1}{2} \times 2\pi r = 22 \text{ cm}$

Distance = $8 + 22 + 7 = 37 \text{ meter}$

b. velocity = displacement / time = $(8+7) / 5 = 3 \text{ m/sec in the east direction}$

22. 1. True

2. The chromosomes are arranged at the cell equator in metaphase.

3. regeneration

4. At (1).

5.a. Long-sightedness.

b. By using convex lens which collects the rays before falling on the eye so the image is formed on the retina.

23. 1. Object is at distance more than focal length but less than double focal length

2. Object is at distance less than focal length

3. Object is at distance more than double focal length

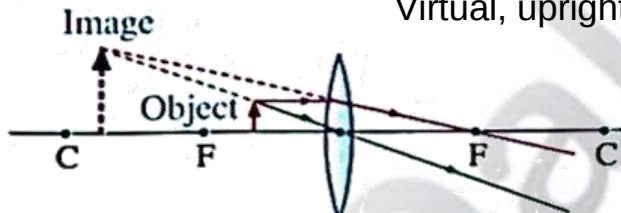
24. 1. Prophase

2. Anaphase

3. telophase

4. the cell prepares for division by the occurrence of some important biological processes and the duplicating the amount of the genetic material (DNA).

25. Virtual, upright and larger than object



26. 1. $12/2 = 6 \text{ cm}$ 2. $12 + 20 + 8 = 40 \text{ cm}$ 3. Inverted

27. 1. Virtual, upright and diminished / behind the mirror

2. Virtual, upright and larger than object / in the same side of object

3. no image formed

4. real, very fine at focus

28. 1. acc in first stage = $V_2 - V_1 / t = (10 - 0) / 4 = 2.5 \text{ m/sec}^2$

acc in second stage = $V_2 - V_1 / t = (5 - 10) / 2 = -2.5 \text{ m/sec}^2$

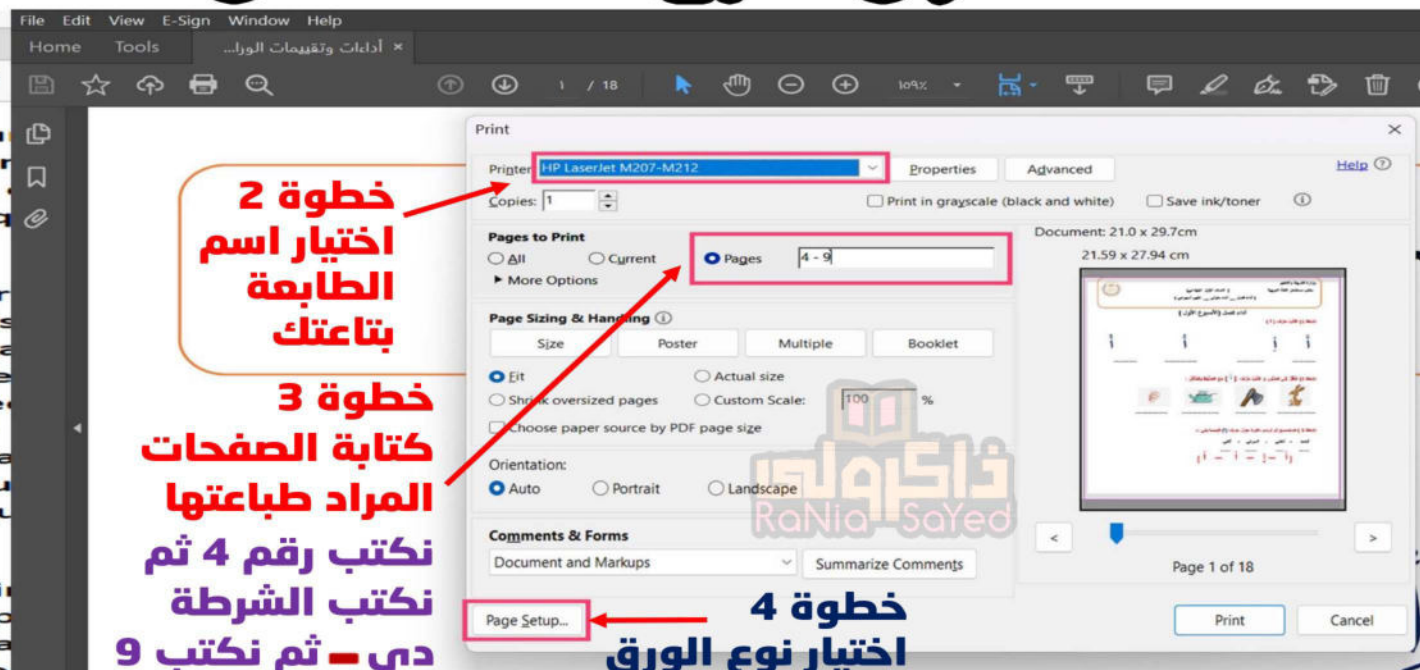
2. $t = (V_2 - V_1) / a = (0 - 5) / -2.5 = 2 \text{ second}$

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



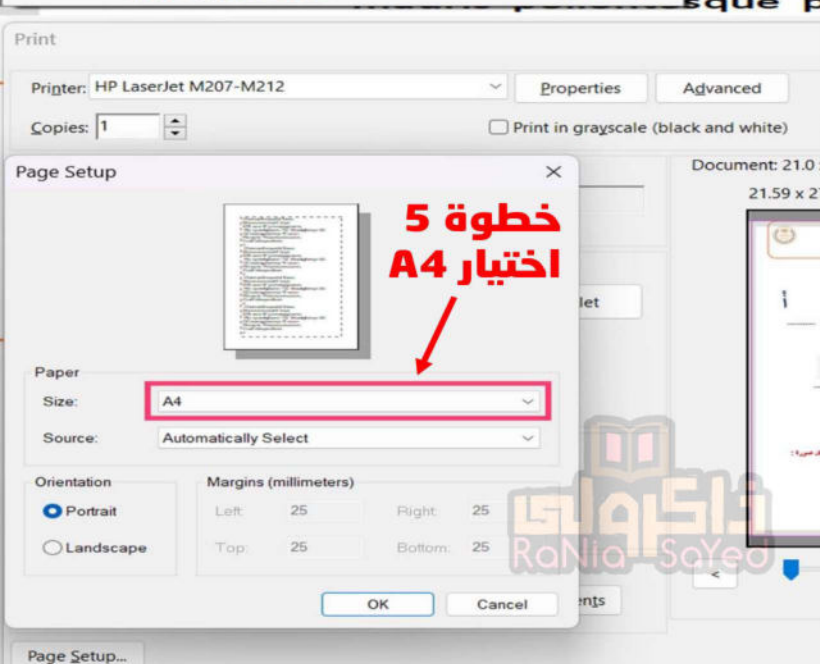
خطوة 1



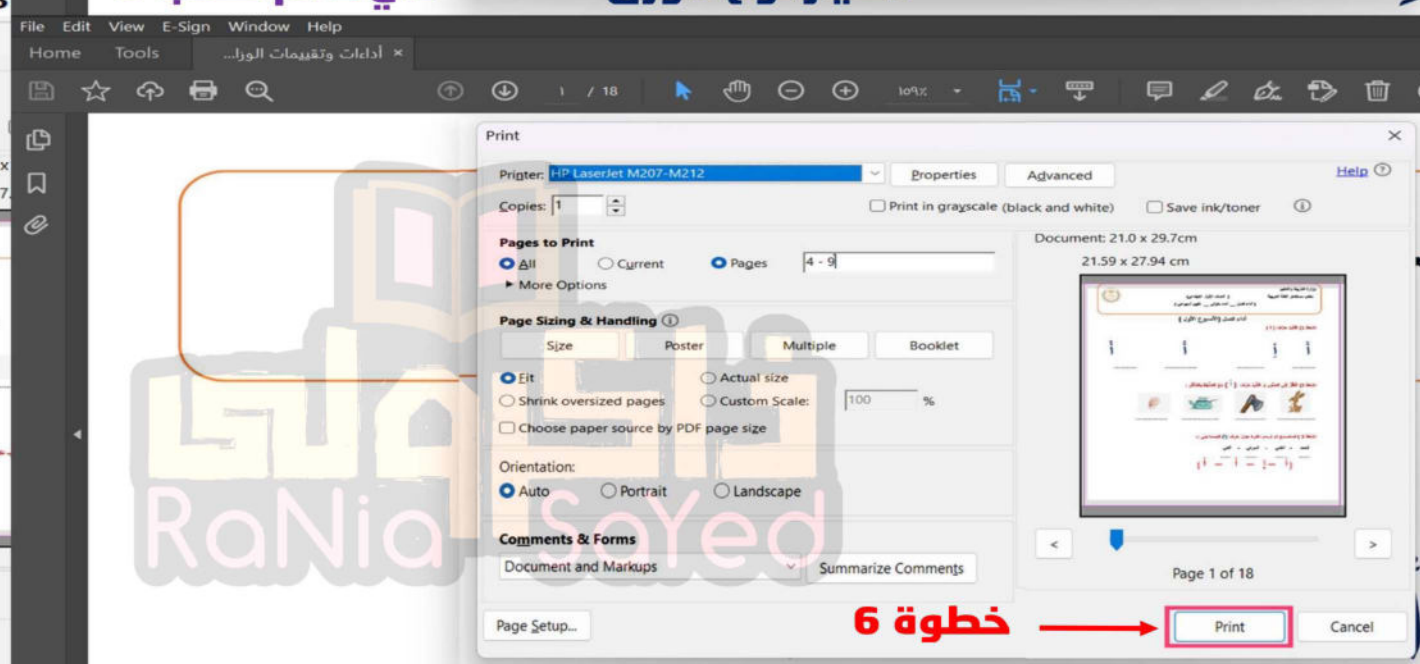
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6